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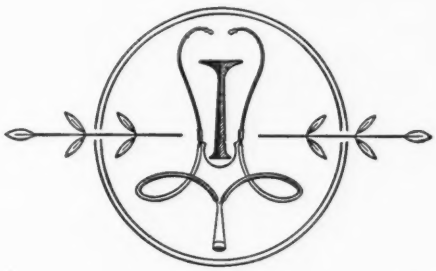

EMERGENCY ABDOMINAL CONDITIONS AMONG INFANTS AND CHILDREN—Roger L. J. Kennedy, M.D., Rochester, Minnesota . . . . . Page 325

PROLONGED LABOR—L. A. Calkins, M.D., Kansas City, Kansas . . . . . Page 331

THE RECOGNITION AND MANAGEMENT OF THE FUNCTIONAL DISEASER—Robert Sohlberg, Jr., M.D., McPherson, Kansas . . . . . Page 334

MANAGEMENT OF THE MENOPAUSAL SYNDROME WITH STILBESTROL—Louis K. Zimmer, M.D., Lawrence, Kansas . . . . . Page 339

IRON DEFICIENCY ANEMIA—Earl L. Mills, M.D., Wichita, Kansas . . . . . Page 344

DENTISTRY AS IT PERTAINS TO MEDICINE—Clair J. Wilson, D.D.S., Hays, Kansas . . . . . Page 348

COMPLETE TABLE OF CONTENTS . . . . . Page IV

VOLUME XLII August, 1941 NUMBER 8

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TABLE OF CONTENTS

AUGUST, 1941

ORIGINAL ARTICLES

Emergency Abdominal Conditions Among Infants and Children—Roger L. J. Kennedy, M.D., Rochester, Minnesota . . 325

Prolonged Labor — L. A. Calkins, M.D., Kansas City, Kansas 331

The Recognition and Management of the Functional Diseaser—Robert Sohlberg, Jr., M.D., McPherson, Kansas 334

Management of the Menopausal Syndrome with Stilbestrol—Louis K. Zimmer, M.D., Lawrence, Kansas 339

Iron Deficiency Anemia — Earl L. Mills, M.D., Wichita, Kansas 344

Dentistry as it Pertains to Medicine—Clair J. Wilson, D.D.S., Hays, Kansas . . . 348

EDITORIALS

Theodore Caldwell Janeway 353

Public Health Programs 353

MISCELLANEOUS

President's Page 352

Tuberculosis Control 355

News Notes 356

Auxiliary 364

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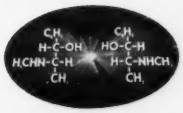

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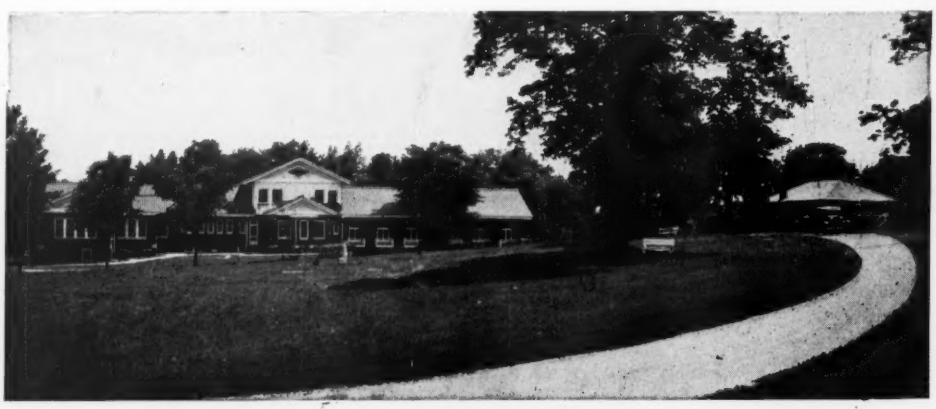

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AMMONIA PLANT A FEATHER IN KANSAS' INDUSTRIAL CAP

The location of the $17,700,000 ammonium nitrate plant between Pittsburg and Baxter Springs is a feather in Kansas' industrial cap—and one of the outstanding accomplishments of the men and women who have worked so untiringly in behalf of Kansas industrial development.

The plant will occupy a 2,800-acre site probably south of Pittsburg on the Spring river. It will employ 300 men at the start and eventually 900 working in three shifts. It will consume 126,000,000 cubic feet of gas a day and 75,000 tons of coal annually.

The chemical project will consist of three separate plants. The first in the series will produce anhydrous ammonia, the second will continue the process by conversion of anhydrous ammonia into nitric acid, and the third will complete the processing of ammonium nitrate. Millions of gallons of water will be used daily.

The value of Kansas' resources to the nation during the present crisis is well demonstrated by the selection of Southeastern Kansas for this plant. The Kansas site was chosen by Washington officials because of the abundance of both coal and natural gas in the area. Natural gas will be used extensively in the chemical processes, but in the event that the supply of gas should be diverted, the plant can be converted easily and quickly to continue operations with coal alone.

Of utmost importance to Kansas is the fact that the plant can be readily adapted to peacetime production when the present emergency is over. As a peacetime industrial backlog, it could be converted into a unit of the new plastics industry after the emergency. Of equal importance is that a by-product of the plant will be a chemical waste to be used in the production of nitrates to fertilize Kansas farms.

It is gratifying to those who long have preached the potentialities of Kansas' native resources that these resources are being harnessed to meet our nations' defense needs. Kansas, rich in raw materials and manpower, is rapidly becoming an important cog in the machinery of defense.

Also gratifying to the modern builders of industrial Kansas is the prospect of the future—for Kansas' main defense works, chemical and aircraft plants, may well continue their production during times of peace and provide a stimulus for the industrial expansion our state needs and deserves.

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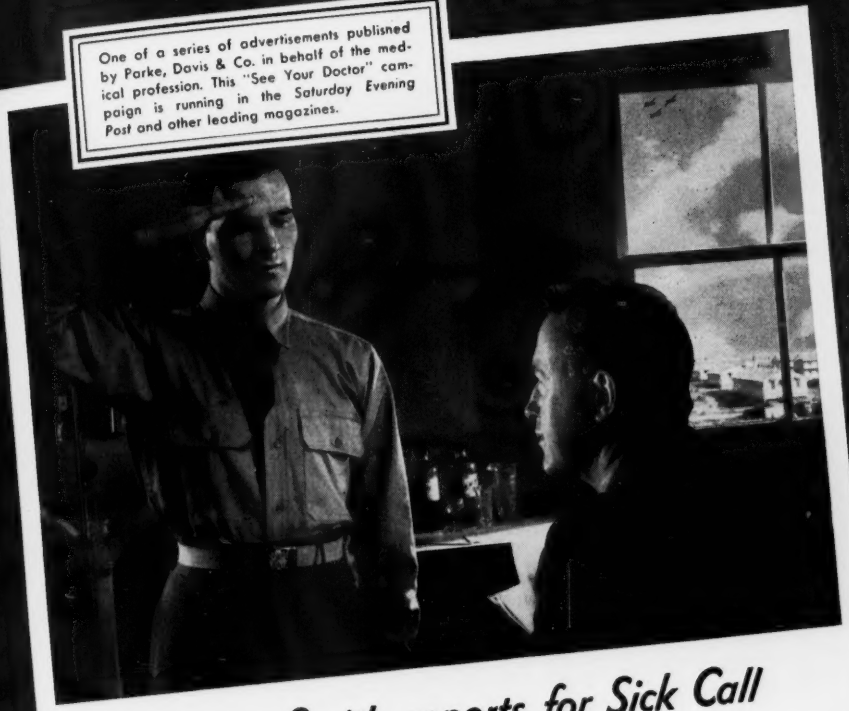

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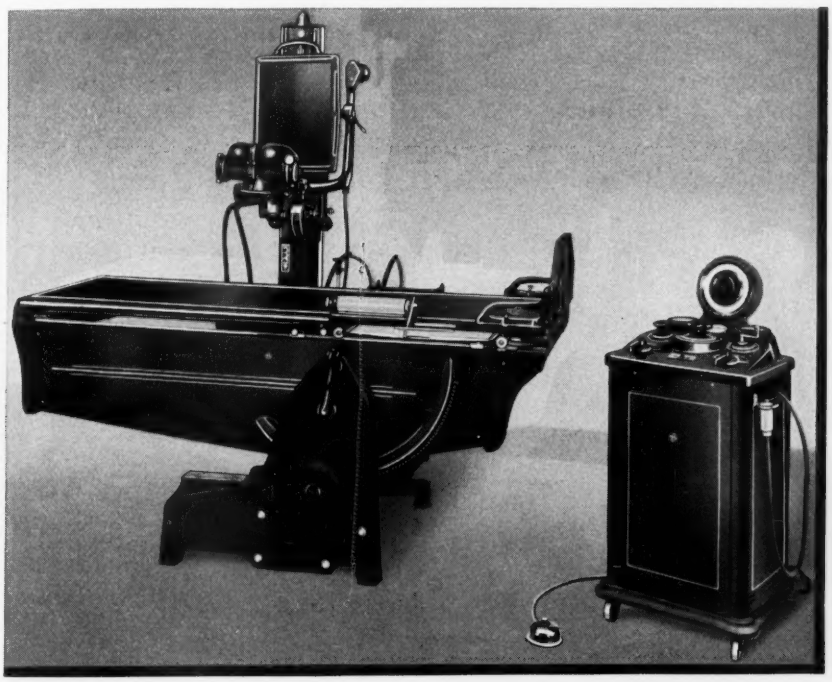

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EMERGENCY ABDOMINAL CONDITIONS AMONG INFANTS AND CHILDREN*

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Rochester, Minnesota

Two chief difficulties face the physician who is confronted with the problem of deciding whether an infant or child is suffering from an abdominal condition which should be considered as an emergency; that is, one which demands immediate surgical relief. On the one hand, he must recognize the conditions for which surgical intervention is imperative, and on the other, what frequently is much more difficult, he must be able to determine when an apparent emergency is to be accounted for by the presence of some non-surgical disease. Success in arriving at a proper diagnosis frequently will depend upon a proper approach to the young patient, sufficient time to elicit a complete history and to carry out a thorough examination and a knowledge of the possibilities which may explain the signs and symptoms.

CONGENITAL OBSTRUCTION

In the newborn infant the prompt return of food may occur after every feeding. Sometimes the vomitus contains only food. At other times there may be bile in it. In the presence of abdominal distention, particularly in the epigastrium, in the absence of stools and sometimes with visible peristalsis from left to right, the possibility of congenital atresia or other types of pyloric or duodenal obstruction must be considered. Obviously, if the obstruction is complete, surgical measures must be carried out promptly to afford relief, where that is possible.

PAIN

Evidence of pain probably is the most common indication of the presence of acute intra-abdominal disease among infants and children. Among really young patients, that is, those aged two or three years and less, objective findings must be relied on almost entirely, since these patients are unable to describe subjective sensations.

COLIC

Crying or screaming by the small infant usually is interpreted by persons outside the profession, and frequently by physicians, as an indication of abdominal pain. No doubt the diagnosis most frequently made for such a young patient is colic. The baby of two or three to ten or twelve weeks of age begins to cry lustily between feedings and particularly at night. Frequently, he will flex the legs at the knees and the thighs on the abdomen. This is interpreted as representing certain evidence of pain in the abdomen; that is, "stomach-ache." Then and there begins a long list of procedures aimed at curing the baby of his "colic." Walking the floor with the infant, rocking the infant in a cradle, application of a hot water bottle to the abdomen, giving of a nipple as a pacifying measure, administration of paregoric, laxative agents and physics are usually tried and found to be of no avail in controlling the condition. Discontinuance of breast-feeding, change from simple milk formulas to evaporated milk formulas or to lactic acid milk formulas, to goat's milk and back again to simple milk formulas, all seem to make the condition worse rather than better.

A carefully obtained history in such a case usually will reveal certain facts, such as the following in a hypothetic case. The infant's birth and progress were normal up to two or three weeks of age. From that time onward the baby seemed to have much pain in the abdomen, cried much, drew up the legs while crying, and kept the entire family awake. All sorts of arrangements for feeding were tried. The child continued to gain in weight. Examination reveals a well-developed and well-nourished infant. The abdomen is soft, not distended, apparently not tender and there are no palpable masses. The rectal temperature is normal. The inguinal rings are closed, the umbilicus is not bulging and is not reddened. Results of examination, in other words, are negative.

The problem in such a case is one, first of convincing the parents and frequently the grandparents

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that there is nothing seriously wrong with the baby and second, of securing their co-operation in allowing the baby to be quiet and to develop regular habits of eating, resting and perhaps also of crying. If the supply of breast milk has not disappeared, the baby should be returned to the breast, and it should be made certain that it receives an abundant supply of food. Complementary feeding may have to be resorted to until the supply of breast milk has become adequate.

Although this particular type of so-called colic is not in itself an example of an emergency abdominal condition it is to be distinguished from conditions which actually are examples.

PYLORIC STENOSIS

Although, ordinarily, pyloric stenosis or obstructing fibrous bands do not create the picture of an acute condition the first indication of their presence may be sudden and there may be evidence of severe pain and vomiting. The presence of visible peristaltic waves passing from left to right usually is conclusive evidence of obstruction at or near the pylorus. I have observed one infant, aged seven weeks, who was subjected to a Rammstedt operation two days after the onset of symptoms, which appeared suddenly and were severe from the time of onset. A markedly hypertrophic pyloric muscle was found and incised.

INTUSSUSCEPTION

Evidence of colicky abdominal pain among infants from six months to two years of age should give rise to the suspicion not only of incarcerated hernia but also of intestinal obstruction and most frequently of intussusception. For some time after the onset of intussusception the only symptoms may be a sharp cry which recurs at intervals up to an hour. Between the paroxysms occasioned by the periodic excessive peristaltic efforts of the bowel to rid itself of the invaginated mass, the child appears to be rather comfortable. He may and frequently does fall asleep. His general condition does not appear to be bad.

As intussusception progresses, vomiting and characteristic bloody discharges from the bowel appear. Usually, by twelve to eighteen hours after the onset, there is evidence of toxemia and shock. The child may become more quiet. Pallor and sunken eyes are evident. The baby becomes less aware of his surroundings. With the advent of the more serious stage of the condition fever of variable degree occurs.

For some time after the onset the abdomen may appear to be fairly normal. During the paroxysms of pain it is held rigid as the baby cries out with discomfort. In the intervals between the episodes of pain, the typical, sausage-shaped mass may be palpated along the course of the ascending and transverse portions of the colon. It may be well to emphasize the fact that failure to palpate such a mass may be disregarded if the other striking features are present. Further, it is to be remembered that a papable mass is less likely to be present in cases of ileo-ileal intussusception than in the more usual instances of ileocolic or colocolic forms.

Within the first few hours after the onset of intussusception, digital examination of the rectum probably will not reveal the mass, which later may be evident. However, the examining finger on withdrawal will be coated with blood or bloody mucus. Such an observation is corroborative of intussusception and is an indication for immediate surgical treatment. It is true that in a large percentage of cases the intussuscepted mass presents in the rectum or at the anus, so that it can be easily palpated and at times visible, but by the time this happens the process will have been present so long that gangrene has occurred, so that the possibility of reduction of intussusception has ceased to be. Every effort made to determine the presence of intussusception is worth while, so that the condition may be diagnosed and treated before irreparable changes take place in the bowel.

The prognosis in cases of acute intussusception is dependent on several factors. The most important of these is the duration of the process from the time of onset to the time of treatment. If every instance of the condition could be recognized and treated within twelve hours after onset, the mortality rate would be low. It is for this reason, just as is the case with acute appendicitis, that the parents should be taught to report to the physician untoward behavior on the part of infants, and that the physician should learn not to regard lightly the early symptoms of these two conditions which may be so lightly dismissed as representing merely "belly-ache."

The situation of the lesion caused by intussusception probably is next in importance in determination of the chances for recovery. If intussusception is ileocecal, the chances that it may be reduced are better than they would be if it were of the ileo-ileal type. The smaller ileum can be withdrawn from the larger colon into which it has become telescoped. Frequently this may be accomplished with ease by means of one of several procedures and attention can be directed to the bowel so as to prevent recurrence. If the invaginated bowel has become gangrenous, resection, performed in either one stage or two stages, is necessary, in which case the prognosis becomes very grave. If the ileo-ileal type of intussus-

ception has occurred the possibility of reduction without resection is decidedly smaller and for that reason, this type of intussusception, though it is less frequent, presents a much more formidable problem than do the other types.

The essential treatment of intussusception is of course surgical. Occasionally, intussusception undergoes spontaneous regression, or regression may be brought about during the administration of an anesthetic agent preliminary to operation. General supportive measures to combat toxemia and shock also are of importance. Transfusions of blood and the intravenous and subcutaneous administration of fluids such as physiologic solution of sodium chloride and solutions of glucose are the chief supportive measures to be used.

INGUINAL HERNIA

Perhaps the infant has not only cried lustily, but has screamed rather continuously at intervals of a few minutes to an hour for a period of a few hours or a day. Such a circumstance concerning an infant who has seemed to be well up to the time the crying is noticed is cause for the careful taking of a history and the making of an examination, including abdominal examination. The cry or scream coming at intervals should give rise to a suspicion of real colic. Examination of the inguinal rings may give evidence of a firm mass, palpation of which may result in increased outcry indicative of tenderness. The diagnosis of incarcerated inguinal hernia is then clear; if knowledge of a previous hernia can be obtained, such a diagnosis is almost certainly correct.

It is obvious that the presence of a hernia is essential to the occurrence of this condition. Since strangulation is due to inability on the part of the involved portion of the bowel to return from the sac into the peritoneal cavity, it is evident that herniation through a relatively narrow opening at the site of the internal ring offers greater chance for obstruction to easy return than does herniation through a relatively wide and gaping internal inguinal ring.

Although it would appear that a strangulated inguinal hernia in an infant or child is a self-evident condition, there are certain considerations which may result in delayed attention to, or indeed may lead to complete oversight of, the condition.

The fact that the hernia is small may give rise to the belief that the symptoms of pain, emesis and later, toxemia, are of other origin.

Occasionally, the rather cystic feel of the herniated mass to the examiner's hand so simulates the feeling of hydrocele as to be misleading. Irreducibility is to be expected in the case of hydrocele and the fact, therefore, that the mass cannot be reduced may support the view that it is a hydrocele.

However, in any case (especially one in which a hernia is known to have been present) in which sudden intermittent pain, perhaps with emesis, afflicts an infant or child and in which a mass is present in the inguinal region, strangulated inguinal hernia must be suspected.

Acute inguinal adenitis may be distinguished from hernia by (1) the finding of a superficial inflammatory lesion of the thigh, leg or foot accounting for a focus of infection, (2) a difference in situation, adenitis occurring in the region of the superficial or deep inguinal lymph nodes, (3) excessive tenderness, (4) discoloration of the skin and (5) knowledge of the lack of a previously existing hernia.

The treatment of incarcerated or strangulated inguinal hernia is surgical. In the case of strangulated hernia, as is true in the case of intussusception, spontaneous reduction may take place or the hernia may reduce itself on the administration of an anesthetic agent preparatory to surgical intervention. If the evidence is strong that strangulation was of short duration, thus eliminating the possibility that the bowel has undergone necrotic change or that the circulation has had opportunity to be permanently damaged, nothing further need be done. If, however, strangulation still persists or has persisted for a considerable time before spontaneous reduction occurs, surgical exploration is advisable.

VENTRAL HERNIA

Rarely, the same type of crying is present as that which is associated with inguinal hernia, and can be accounted for by a ventral or umbilical hernia in which a portion of underlying tissue has been caught, the tension, pull or pressure of the surrounding tissue causing the pain.

OTHER LESIONS WHICH CAUSE ACUTE OBSTRUCTION

In addition to intussusception and strangulated ventral and inguinal hernias, other less frequently occurring causes of obstruction must be considered when sudden abdominal pain, vomiting, abdominal tenderness and evidence of toxemia are present. Among these are volvulus, thrombosis of mesenteric vessels and cysts of the intestinal wall, so-called enterogenous cysts. Although the presence of these conditions seldom is ascertained before operation, the surgeon must be prepared to deal with them if they are found. It is of help at times to remember that among patients suffering from intestinal obstruction, abdominal distention is much more likely

to be present when the site of the obstruction is situated high in the gastro-intestinal tract, so to speak, than when it is situated low. Obstruction situated low in the gastro-intestinal tract will cause abdominal distention only after a considerable period. In any case in which obstruction is suspected, it may be useful to make a roentgenogram of the abdomen and to examine it for distended loops of bowel or for a gas-filled stomach.

ACUTE APPENDICITIS

Of all the acute abdominal conditions which may afflict infants and children, appendicitis continues to be the most frequently encountered and the most dangerous. It causes a mortality rate which might be decreased. The reasons for the present mortality rate, in the final analysis, are delay in recognition of the presence of an acutely inflamed appendix or delay in institution of prompt surgical treatment.

Since appendicitis occurs at all stages of infancy and childhood, the problem of diagnosis differs somewhat according to the age of the patient. Frequently, the classic syndrome of generalized abdominal pain, which becomes localized to the region of McBurney's point, and nausea, emesis and fever, is absent. Very young patients, that is, infants aged two years and less, are likely to present crying as the only evidence of pain when acute appendicitis is present. Emesis that does not relieve the pain is strongly suggestive that appendicitis is present. Emesis and fever may or may not be present. The important factor in such an instance is the examination, and in this, success or failure frequently depends on the exercise of patience and time necessary to overcome the fear and apprehension of the little patient. If, with the patient in the condition of relaxation (which may be present for only an instant between episodes of crying), definite tenderness and muscle spasm can be elicited by pressure over McBurney's point, the likelihood of acute appendicitis may become strong. Thought must be given, of course, to the conditions which may simulate acute appendicitis; especially to pyelitis, mesenteric adenitis, pneumonia and to some of the less frequently encountered conditions. Unless the evidence is rather strongly in favor of one of the latter conditions prompt surgical treatment becomes mandatory.

Tenderness may be only relative, that is, it may be elicited by the lightest touch or may be evident only on deep palpation. Furthermore, comparison of the two sides of the abdomen may be necessary to determine the point of maximal tenderness. The situation of the appendix among children usually is higher than it is among adult persons and frequently the appendix is retrocecal, in which case the point of maximal tenderness would be higher or less definite than a similar point among adult persons.

Rectal examination, which offers even greater difficulty in the young, is of importance and frequently more than repays the time spent in gaining the confidence and co-operation of the patient. In the presence of an acutely inflamed appendix, increased tenderness on the right side is likely to be elicited, and occasionally the examining finger will help to determine the presence of an inflammatory mass.

The leukocyte count in the circulating blood usually is increased to 12,000 or more, the increase being accounted for largely by the increase in the number of polymorphonuclear cells to eighty per cent or more, and when such increases are found, they usually constitute confirmatory evidence of acute appendicitis. However, the absence of such an increase does not rule out acute appendicitis, and conversely, the presence of leukocytosis does not in itself establish the diagnosis of acute appendicitis.

If all instances of acute appendicitis among children could be diagnosed and treated within twenty-four hours after the onset, the probability is that the mortality rate would approach zero. It is among infants and younger children in particular that delay usually takes place and it is among these patients that perforation occurs with such great frequency. Perforation occurs with a frequency that is in inverse ratio to the age of the patient as well as to the curve of incidence. Analysis of a large group of cases showed that the time elapsing between the onset of symptoms and institution of treatment was considerably greater among very young patients, hence, the higher percentage of perforations in that group. Unfortunately, among very young persons the omentum is not fully developed and these tiny patients, therefore, lack the "walling-off" and protective function which reduces the likelihood of early generalized peritonitis among older children and adult persons.

Although the differential diagnosis of acute appendicitis involves the elimination of a number of other conditions, perhaps the greatest problem is presented by the necessity for distinction between appendicitis and pneumonia. It is well to consider the differential diagnostic features in any case in which the possibility of pneumonia is present. Pain in the thorax is not present in appendicitis. Characteristic facies with dilatation of the ala nasae, abdominal breathing and grunting respiration all serve to indicate pneumonia, and are not exhibited in appendicitis. Although vomiting in appendicitis is rather frequent, it is relatively rare in pneumonia.

Diarrhea does occur in some cases of appendicitis, but it is much more common when diseases of the respiratory tract are present. The severe, constant and generalized nature of abdominal pain in pneumonia differs from the paroxysmal, localized pain of appendicitis. In cases of pneumonia with associated abdominal tenderness, the tenderness usually is very marked, but also is definitely superficial. By gradual increase in the pressure exerted by the examining hand, it is possible to press deeply without initiating any increase of discomfort. In appendicitis the opposite is true. Although the tenderness may be slight or severe, it is characteristically more marked on deep pressure and there is usually a maximal point of tenderness which may be found. The rectal examination usually will elicit more tenderness on the right side in cases of appendicitis. Generally, the leukocyte count tends to be high in pneumonia, extending from 20,000 to 50,000 cells, whereas in appendicitis it tends to range from 10,000 to 20,000 cells. The temperature in the presence of pneumonia characteristically increases to rather high values, whereas in appendicitis it seldom increases to more than 102 degrees F. (38.8 degrees C.). If the history, physical examination and leukocyte count do not remove doubt, time should be taken to make a roentgenogram of the thorax to exclue shadows, particularly in the lower lobe of the right lung.

MECKEL'S DIVERTICULUM AND MESENTERIC ADENITIS

Although it is always desirable to determine, if possible, the exact nature of any disturbance that gives rise to the picture of acute abdominal disease before surgical intervention is carried out, two conditions other than acute appendicitis offer diagnostic problems which usually make it impossible to distinguish them from acute appendicitis. These are an inflamed Meckel's diverticulum and acute mesenteric adenitis. Either may produce a picture which is clinically indistinguishable from that of appendicitis. The character and situation of the pain, elevation of temperature, polymorphonuclear leukocytosis and point of tenderness may indicate involvement of the appendix, but at operation the appendix may be found to appear normal. The importance of Meckel's diverticulum and of mesenteric adenitis as possible sources of the clinical disturbance then becomes prominent, for the surgeon must explore the terminal portion of the ileum and the mesentery for the presence of one or the other of these conditions as an explanation of the symptoms. It obviously would be an error of judgment to close the abdomen after removal of a normal appearing appendix without the making of a search of these two regions for more definite signs of disease. If there is a history of intermittent melena, the presence of Meckel's diverticulum can be strongly suspected. Some authors have expressed the opinion that acute mesenteric adenitis can be distinguished from acute appendicitis, but this opinion does not appear to be tenable. While I am considering acute mesenteric adenitis, it may not be out of place to insist that the making of a diagnosis of acute mesenteric adenitis is not justifiable by the mere finding of rather large mesenteric lymph nodes at the time of operation. The fact that children who are well nourished and who have not been subject to a prolonged or wasting disease are bountifully supplied with lymphoid tissue must be kept in mind when the presence of disease in the lymph nodes is evaluated merely on the basis of the size of the nodes. To be certain that acute mesenteric adenitis is the cause of the symptoms, it is necessary to remove a lymph node and demonstrate by pathologic examination the presence of acute inflammation.

PRIMARY PERITONITIS

Abdominal pain, generalized tenderness and rigidity are generally accepted as being prime indications of peritonitis. Among infants and children the most common cause of these signs is a perforated appendix with spread of infection throughout the peritoneal cavity. However, children occasionally are encountered who exhibit these signs, but in whom the peritonitis has an entirely different basis. They may have so-called primary peritonitis. Unless the history is typical of a history of acute appendicitis, the exact cause may not be determinable. If the condition is one of primary peritonitis, operation of course is futile. On the other hand, primary peritonitis may be present without any of the three cardinal signs of peritoneal infection. It has happened in our experience at the clinic that an infant suddenly became very ill, presented the picture of severe intoxication with ashen-gray pallor, sunken eyes, high fever and marked leukocytosis, and died within thirty-six hours without evident abdominal tenderness, rigidity or distention, only to have demonstrated at necropsy the fact that the cause of illness and death was acute primary peritonitis.

TUMORS OR MASSES

Most commonly, intra-abdominal tumors do not give rise to acute symptoms but there are instances in which the physician may be in considerable doubt as to the presence of an abdominal emergency condition among infants or children in whom sudden abdominal pain develops and in whom intra-abdominal masses are demonstrable.

A distended bladder caused by acute retention of urine will explain some of these apparent masses.

The bladder may be felt as a rather firm mass which extends from nearly the level of the umbilicus, downward and behind the symphysis pubis. Although the nature of the mass should be evident on the basis of situation and consistency, as well as from the history of absence of voiding for eight to twelve hours, it is possible to mistake the nature of the mass and to institute treatment for some other condition.

Occasionally, hydronephrosis will manifest itself in an acute manner. If the affected kidney has undergone considerable enlargement it may be palpable. However, the physician seldom encounters among children the "textbook picture" of intermittent hydronephrosis in which the kidney is said to be palpable when filled but no longer palpable after extensive voiding of urine has occurred.

Cysts of the mesentery, omentum and spleen rarely give rise to acute symptoms and although they are easily palpable after they have attained considerable size, are usually present for long periods before they are discovered.

Pelvic tumors most frequently arise from the ovaries. If such tumors are pedunculated and become twisted, severe pain, abdominal tenderness, vomiting and leukocytosis may follow. Although the suspicion may be entertained that such a tumor is present, the diagnosis is seldom made for children until the time of operation.

TRAUMA

The questions which arise when the physician is considering the effects of trauma to the abdomen might be discussed at great length without inclusion of all the problems which the subject offers. The most important consideration is whether or not rupture of a viscus has occurred, an occurrence which would allow serious hemorrhage or an outpouring of the contents of stomach, bowel or bladder into the peritoneal cavity. In the event any of these has occurred surgical exploration becomes imperative. In addition to information acquired by physical examination, observation of color, respiration, pulse and determination of values for hemoglobin and erythrocytes may be helpful in determining that continuous loss of blood or that increasing peritoneal irritation may be taking place.

One of the most frequent results of abdominal trauma is subserosal bleeding, sometimes to the extent of formation of a large hematoma. In such instances tenderness, rigidity and leukocytosis may be present and lead the examiner to the conclusion that some more serious condition is present and that operation must be carried out.

In cases in which injury has been extensive, the child probably will be in a state of shock when he is observed. This to a great extent tends to mask some of the abdominal signs. As the obvious indications for antishock treatment are carried out, repeated careful examination of the abdomen will be of most help in elicitation of points of tenderness. Injury to each of the viscera may result in observations that are indicative of the special viscus injured. Thus, the presence of blood in the urine will indicate that some degree of trauma to the urinary tract has taken place. The patient's inability to void and an unsuccessful attempt to remove urine by catherterization are strongly suggestive that the urinary bladder has been ruptured. Increasing pallor, an increasing respiratory rate, the occurrence of "air hunger" and decreasing values for hemoglobin and erythrocytes, indicate continuous intra-abdominal hemorrhage.

Tenderness and increasing dulness in one or the other part of the abdomen will suggest the situation of the hemorrhage, and hence, the viscus in which it has taken place. Although it is true that the organ most frequently injured is the spleen, and perhaps secondly the liver, it is also true that, depending on the type of trauma that has occurred and the point of impact, any viscus may be involved. It is well to remember that evidence of intra-abdominal injury may not be present immediately, and that careful watching by the physician for a period is necessary before final conclusions can be reached.

Fake "Eye Doctors" are abroad again, according to a letter received from a farm woman in Kansas who gave an itinerant eye "specialist" $25 for a pair of glasses she has not received.

Several months ago, the so-called doctor called at her farm and after gaining her confidence, suggested he fit her for a new pair of glasses. The woman had felt she needed her glasses changed, but it was difficult for her to get to town to have it done. He pretended to examine her eyes, collected the money and promised the glasses would be sent within a few days. The address he gave her was fictitious, and she has not received the glasses.—From Better Business Bureau Bulletin, Kansas City, Mo.

"The well conducted medical society should represent a clearinghouse, in which every physician of the district would receive his intellectual rating, and in which he could find out his professional assets and liabilities. We doctors do not 'take stock' often enough, and are very apt to carry on our shelves stale, out-of-date goods. The society helps to keep a man 'up to the times,' and enables him to refurnish his mental shop with the latest wares. Rightly used, it may be a touchstone to which he can bring his experiences to the test and save him from falling into the rut of a few sequences. It keeps his mind open and receptive, and counteracts that tendency to premature senility which is apt to overtake a man who lives in a routine."—Osler.

PROLONGED LABOR*

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Prolonged labor is not usually attended by any great danger to either the mother or the baby. It is, however, the cause of a great deal of concern to the family and physical exhaustion to the physician. Medical opinion as to the proper management has varied widely and has resulted in many different forms of therapy, none of which, up to date, has been entirely satisfactory. Medical literature has not offered anything like an adequate explanation of the cause of the lengthening of this usually physiological process. Until one knows the cause of any abnormality one is rarely able to apply anything like adequate treatment. It would seem, therefore, that the reason or reasons for long labor would long ago have been thoroughly searched out and explored. That such has not been done can probably be explained on several grounds.

We have had handed down to us many different explanations, some of which seem to apply in each given instance of prolonged labor. Elderly primiparas have long been thought to be fit subjects for prolonged difficult labor. The short, fat woman has been considered a bad risk in this respect. Premature rupture of the membranes with so-called "dry labor" has been feared by laity and profession alike. Abnormal presentation has been blamed for our difficulty in many instances. Small pelvis or large baby leading to disproportion in the obstetric passage is frequently offered as the explanation of difficulty. A rather careful search of the literature does not reveal convincing proof that any of these explanations or all of them together can be made to apply to anything more than a very small fraction of the prolonged labors so frequently observed in routine practice. Realizing this fact, we attempted some ten years ago[1] to see whether any of these explanations or all of them together might, in part, explain this rather frequent phenomenon of prolonged labor. We demonstrated in a considerable series of cases that there was no tendency for the labor to be longer in older primiparas than in young ones. Neither height or weight of the mother was found to have any bearing on the length of the first stage. Large babies were born in as short a time as small ones. A small pelvis did not, in any way, prevent dilation of the cervix. While we could not say that brow presentation and shoulder presentation might not cause a prolonged labor, we did demonstrate that neither breech nor occiput posterior made any considerable difference in the length of the first stage of labor.

Much of the uncertainty about prolonged labor has risen out of a certain amount of confusion of two kinds. In the first place, what might well affect the second stage of labor; namely, a large baby or a small pelvis; has also been given as a cause of difficulty in the first stage. If one will critically analyze the processes involved, it will seem quite obvious that this source of confusion should not exist. The first stage of labor has to do with effacement and dilation of the cervix which apparently goes forward about as well with the head of the baby lying free above the pelvis as it does when the presenting part is low in the birth canal (a slight difference will be demonstrated presently). The second stage of labor, on the other hand, has to do with the passage of the baby through the birth canal and, therefore, might be impeded by any considerable degree of disproportion. The first stage of labor is carried forward purely by involuntary muscle. It cannot be consciously controlled by the patient and is not affected by any condition in the patient unless, through the medium of fear and disproportionate excitation of the sympathetic nervous system[4], there may result a relative paralysis of the autonomic stimulation of the uterine muscles. The second stage of labor, on the other hand, is, at least in part, a voluntary process. Although the uterus affords a large part of the driving force, considerable aid is afforded by the muscles of the diaphragm and abdominal wall and considerable resistance is afforded, in most cases, by the voluntary muscles of the pelvic floor. These two stages of labor are, therefore, so entirely different that one frequently observes that a markedly prolonged first stage is followed by a very short second stage. Moreover, a considerable number of short first stages are followed by expulsion phases actually longer than the first stage. In any large series of cases one can usually demonstrate[1] that there is no correlation between the duration of the first stage and the duration of the second stage.

The second cause of confusion has arisen from the fact that it is frequently difficult to determine whether a given patient is actually in labor or only having false pains. Sometimes, hours of observation are required before one can say that a patient is in labor or only having settling pains. This is not only true of a patient who has these apparently rather severe pains and who then stops and goes several weeks before true labor ensues, but it is also true—

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and much more confusing—that these apparently false pains in other patients change over very abruptly into true pains with no interval between. At the present time we can, in such instances, only count both the false and true pains as a part of labor as we have no measure which will allow us to differentiate accurately between them. One clinical test of some value in this respect is the administration of one-sixth grain of morphine hypodermically. False pains will nearly always be completely stopped by the drug in this dosage whereas true pains will, at most, be somewhat slowed. If this test be too long delayed and only given at or about the time the patient changes over from false to true labor, further confusion may result. No other method known to the writer at present offers any considerable hope of eliminating this source of confusion.

The first stage of labor in primiparas requires on the average some twelve or thirteen hours; the second stage of labor about one hour. Almost all instances of prolonged labor are prolongations of the first stage. We have had only some dozen instances of the second stage prolonged beyond three or four hours in our last four thousand patients. The consideration of prolonged labor, therefore, is a consideration of prolongation of the first stage, and the remainder of this discussion will be limited to the first stage of labor.

Some years ago we realized that to understand the total length of time required to dilate the cervix we must know the condition of that cervix at the beginning of labor, as we realized that marked variations at the onset were the rule and not the exception. A considerable number of patients go into labor with the cervix quite well effaced and perhaps partially dilated. A majority of primiparas go into labor with the cervix partially effaced and with little or no dilation. A few primiparas enter labor with a long, closed, rather firm cervix. Obviously the total amount of work to be done will vary greatly in these separate groups.

Usually at the onset of labor, the pains are relatively weak, of short duration, and at intervals of several minutes apart. As labor progresses, the contractions become more intense, of somewhat longer duration, and at more frequent intervals. Variations, however, are very frequent. Quite often one will observe the same type of pains toward the end of labor as have been present in the beginning, obviously leading to a more prolonged process than if the pains had become harder and more frequent. More rarely, a falling off in the pains will be observed—so-called secondary inertia.

Over the last several years, we have been able to collect a series of 676 primiparas seen at the onset of labor. The condition of the cervix has been accurately recorded in each of these patients, and the character of the labor pains determined and recorded at the successive stages of dilatation. (A series of 374 multiparas has been collected in the same period.) On the basis of the data recorded in this group of patients, we now have what looks like an adequate explanation of most, if not all, of the variations commonly observed and feel that we have found the principal explanation of prolonged labor.

Four pieces of information seem necessary to determine the probable length of labor in any given patient.

Effacement of the cervix seems to require about three hours of labor pains in a primipara (two hours in multipara). Most of our patients entered labor with at least partial effacement so that it would perhaps be more proper to say that remaining effacement requires about three hours on the average.

Our patients were roughly divided into two groups according to consistency of the cervix noted at the first examination. If the cervix was of a consistency of one's lip or softer, it was called "soft"; if of the consistency of the ala of the nose or firmer, it was called "firm". The firm cervix is relatively common in primiparas and relatively rare in multiparas. It seems to require about three hours more of labor pains to produce complete dilation in primiparas than is required by the soft cervix (two hours in multiaras).

If the presenting point was at or below the level of the ischial spines at the onset, the first stage of labor was one hour shorter than if the presenting point was at a higher level (the same for multiparas).

We divided our patients into three groups according to whether they had "good", "fair", or "poor" labor pains. In this grouping, we found that duration of the individual contraction was a matter of little or no importance, and we disregarded it in our classification. Intensity of contraction and frequency of contraction were both found to have a definite bearing on the progress of labor. Pains three minutes or less apart at the beginning of the dilation phase (not during effacement) and of at least fair intensity were said to be good pains. If they were less frequent or of poor intensity, they were said to be fair pains. If they were both infrequent and of poor, weak intensity, they were said to be poor pains. It was found that the primiparas with fair pains required about three hours more to dilate the cervix (multiparas two hours) than did those patients whose pains were good. Poor pains in primiparas prolong the first stage by about nine hours

(six hours for multiparas). Thus, it is apparent that station is a matter of relatively little moment, cervical effacement and cervical consistency are definite factors, and the all-important factor is the labor pains. Incidentally, it may be said in passing that none of the frequently observed presentations, such as occiput anterior, occiput posterior, breech, etc., have any bearing whatsoever on the duration of the first stage of labor. The proof of this is quite involved and will be given in a separate publication. It may also be said that the size of the baby is not a factor in the duration of the first stage of labor. Thus, none of the explanations previously offered has any bearing, and the only two factors concerned, as far as we now know, are (1) resistance offered by the cervix and (2) the frequency and intensity of the uterine contraction. Station apparently plays a definite, though minor, role. Whether it will be found that premature rupture of the membranes has any effect on either lengthening or shortening the first stage of labor, we cannot yet say. No adequate proof has yet been offered, and our own series of patients is too small upon which to base any definite statement.

Let us see from actual experience with this series of patients what may be expected under given conditions. One hundred thirteen primiparas (about one-sixth of all cases) entered labor with the cervix effaced and soft, the head engaged, and the pains became good. The average duration of the first stage of labor in this group was three hours seventeen minutes. There were only three whose labors exceeded six hours, and the longest was six hours fifteen minutes. Under favorable circumstances such as these, a labor in excess of twelve hours would be truly prolonged. In fact, under these conditions, one should seriously search for some unrecognized abnormality if the first stage goes much beyond three or four hours.

Taking the above group of 113 patients as a basis of comparison and altering each of the four factors in turn, we find that lack of effacement at the onset of labor (fifty-nine patients) resulted in about three additional hours of labor. A firm cervix also caused about three hours more to elapse before the cervix was completely dilated. If all other conditions were favorable, but the pains were only fair (thirty patients) the average was six hours forty-four minutes. A high station, everything else favorable, (forty-one patients) resulted in a first stage of four hours twenty-three minutes—about one hour more than the most favorable group.

Multiplication of abnormal factors resulted in progressive increases in the duration of the first stage so that, when we reach the group where everything was unfavorable—non-effacement, high station, firm cervix, and poor pains, a group of sixteen patients showed an average duration of the first stage of twenty-nine hours thirty-seven minutes. The labor in nine of these sixteen patients exceeded twenty-four hours and in no instance was the labor less than twelve hours. I am not in a position to say what would be prolonged labor under these circumstances, but I can say quite definitely that more than twenty-four hours of labor pains is to be expected and is, therefore, not an abnormality.

It would seem, therefore, that a fully adequate explanation of the variation all the way from one to two hours (average three hours seventeen minutes) up to thirty-odd hours of labor pains is to be found in the two factors of cervix and labor pains and that, therefore, we probably need not look further for the cause of prolonged labor. When it is realized that almost all patients with labors much beyond twenty-four hours have probably had at least several hours in the beginning of "false" pains, the above explanation becomes all the more adequate.

What should be done in the way of therapy can, if the above explanation is fully accepted, now be studied much more directly than heretofore. We may rightfully expect progress to be made in this direction.

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Transfusion of stored blood without preheating is a safe, convenient and economical procedure which often avoids dangerous delays, Elmer L. DeGowin, M.D., Robert C. Hardin, M.D., and L. W. Swanson, M.D., Iowa City, declare in The Journal of the American Medical Association for March 9.

From a detailed study of ten patients who were given transfusions of blood mixtures varying from 77 to 59 F. they concluded that no significant lowering in the body temperature, no consistent changes in blood pressure and no untoward symptoms could be attributed to the procedure. They then administered preserved blood without preheating to 568 patients and again observed no reactions attributable to this method.

"It is still common practice," the authors point out, "to maintain at body temperature fluids which are being administered into the veins. This principle is of practical clinical importance because considerable labor is expended by the intern and nursing staff and frequently costly apparatus is used in an effort to maintain fluids at body temperature during injection. When the preserved fluid is blood, there is the danger of disintegration of the blood from the injudicious application of heat. Time may be consumed in warming blood to room or body temperature."

THE RECOGNITION AND MANAGEMENT OF THE FUNCTIONAL DISEASER*

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The functional diseaser is that patient who is suffering from an illness which is due to his mental state. Such illness has been called neurosis, hypochondria, hysteria, and other names with which are attached certain stigmata in the minds of the laymen. It is my purpose to treat this class of patients as a whole and to bring out certain points in etiology, diagnosis and treatment which apply regardless of the specific symptoms of which the individual patient complains.

The problem of dealing with patients whose troubles are functional is one which confronts every general practitioner at least daily. During 1940 my practice, which is general, included patients from practically every classification of medical science. Of my patients who were over twenty-one years of age 11.4 per cent consulted me for functional diseases only; 25.4 per cent were treated for functional conditions as well as others which were not functional; while 63.2 per cent had no functional complaints. Considering the first two groups together, 36.8 per cent of my patients required medical attention during the year for functional disease although some of these people had other non-functional conditions as well. Other physicians have placed the incidence of functional diseasers in general practice as high as forty or fifty per cent.

I cannot overemphasize the importance of taking these poor unfortunates seriously. By taking them and their complaints lightly, or even ridiculing them, the medical profession is playing into the hands of the cultists, faddists, and irregular practitioners. Functional diseasers are with us now in greater numbers than ever before and it behooves us all to accord them the consideration due any patient regardless of the cause of his illness.

The functional diseaser may center his symptoms around one organ system or, on the other hand, they may be diverse and unrelated. In the latter case the functional nature of the illness is rather easily recognized, while in the former a thorough investigation is necessary before the final diagnosis can be made. In the former group we have patients who present symptoms relating to their hearts, gastro-intestinal tracts, genito-urinary systems, or eyes, to name but a few. In the others, symptoms are manifest all over their bodies in a completely unorganized manner. Some patients in each group may have actual organic disturbances which originated as functional conditions, but I wish to make clear that we are considering only those individuals who are ill because of disturbances of psychic equilibrium.

In discussing the cause of the functional diseaser's illness we must consider some of the exogenous influences which bear most heavily upon him. The tempo of modern life is such that it frequently makes well adjusted individuals feel that they can't keep up. What kind of a feeling, then, must it engender in the minds of those constitutionally inferior people who have a hard time living placidly even under the most quiet and sheltered conditions? Everyone is in a hurry. We travel at high rates of speed, eat at lunch counters, get our news from radio summaries, read our books in condensed form, and generally conduct ourselves as if the judgment day were just around the corner, as perhaps it is.

This state of affairs insinuates itself into business life. The competition for jobs is so keen that the employe must do all that his boss requires and a little bit more. If a man does his job well his quota is raised; if he does it poorly he is fired. Either eventuality is bad for the individual since in the first he must expend more time and energy to reach his new quota, while in the second, the loss of a job means cessation of income with the attendant mental turmoil which besets the unemployed. We have the highest standard of living in this country of any place on the face of the globe and the attempt to maintain it at this high level means more work, more sacrifice of leisure time, more worry and, as a result, more functional diseases.

It seems that matters were not bad enough as they stood so the egomaniacs of Europe started a war which threatens to engulf the entire world before it can be brought to a halt. It has been called, quite aptly, a war of nerves and it is my belief that the nerves are not confined to citizens of the definitely belligerent nations. In this country business men are worrying about their income taxes, mothers fear that their drafted sons will become permanent members of our armed forces, and the draftees themselves have to alter their plans, give up their jobs, and otherwise reconcile themselves to the inconveniences that go with compulsory military training.

Modern life does not constitute a menace to the peace of mind of the well adjusted person, but to others it presents problems of such a nature that attempts at solution leave these people in a state of mental confusion. Strecker[1] says, "We use projec-

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tion to circumvent the hard realities of our conflicts by shifting the blame we should accept ourselves onto someone else or the conditions of life. If practiced too frequently or with too much facility it becomes a menace to integrity of personality and peace of mind. It erects a barrier between the individual and seeing himself as he really is."

The childhood training of the functional diseaser is frequently responsible for his condition. Parents naturally tend to protect their children. They feel that the life of a child should be free from worry, care, and responsibility, for an unsympathetic world will force these things on them soon enough. Consequently they think for their children, shield them, take their parts, and otherwise do everything in their power to inhibit the development of full rounded personalities in their offspring. Thus, when the child grows up he is not trained to make his own decisions, to solve problems of conduct, or to map out a program for satisfactory existence. In an attempt to correct this situation the science of mental hygiene has come into prominence. According to Gardner[2] mental hygiene attempts to preserve mental health by aiding in adjustment. He holds that in times of stress humans revert to instinctive action whereby they surpress painful experiences to their subconscious minds. He feels, moreover, that repressed anxiety is an essential factor in forming a psychoneurosis and is usually the result of an unconscious sense of guilt based upon hatred secondary to frustration of a selfish desire. Although repressed, anxiety never lies dormant but seeks expression and may take the form, by transference, of motor and sensory disturbances closely resembling organic disease.

Some people seem to have been born with a sense of inferiority and others apparently acquire it as they develop. This sense of constitutional inferiority may be enhanced by a weak physical structure and poor resistance giving rise to numerous infectious diseases during childhood and adolescence. The mother of such a child may constantly remind him that he is delicate and soon the child learns that he can avoid many unpleasant duties and responsibilities by hiding behind his frailty. This habit becomes so firmly fixed that as he grows older it becomes an unconscious part of his personality and he develops, literally, into an individual who enjoys poor health.

With the stage all set by a high speed civilization, a nerve racking job, a sense of inferiority, and inadequate early training; what starts the functional diseaser's illness and his self-directed tour of innumerable doctors? According to Barrow[3] about seventy-five per cent of functional diseasers are women and their problems are feminine because men are more apt to recognize the underlying maladjustment or conflict and meet the issue or rationalize it. Anxiety states and depressive neuroses account for the illness in forty per cent of the men but only twelve per cent of the women. Forty per cent of the men and fifty per cent of the women are constitutionally inadequate. The will to get well is not strong because it means going back into a world that is already too great a challenge. Maladjustment to marital and home life cause the trouble in twenty-four per cent of the women and only eight per cent of the men. Worry and dissatisfaction in business produce symptoms in twenty-five per cent of the men while grief is responsible in eight per cent of the women and practically never in men.

The problem which confronts the medical profession resolves itself into recognition of the functional diseaser, rendering him a correct diagnosis, and instituting adequate therapy. In some functional complaints the diagnosis is easy to make, while in others it is most difficult. There is a growing tendency to consider the individual as a psycho-somatic entity. Sanders[4] points out that there is a nervous counterpart to every organic disease and that no form of physical damage exists which is not imitated and reproduced by sensations practically identical with those produced by organic disease. It is interesting to note in this connection that some clinicians believe that there is no such thing as functional disease; that patients falling into this category are really suffering from definite pathology which, to date, we have been unable to identify. This view is expressed by Kennedy[5] who feels that if we dig below the surface of neurologic diseases and find their origins in toxic, chemical, and glandular conditions we will eventually establish a real pathology of mind.

In support of the psycho-somatic approach to diagnosis Fetterman[6] presents some significant facts. He feels that three situations may exist: organic disorders may produce neurotic-like symptoms; organic and functional disorders may coexist independently; and psychic disturbance may produce physiologic and even physical disorders. He further states that certain organic syndromes may be psychogenic, such as essential hypertension, exophthalmic goiter, gastric and duodenal ulcer, cardiospasm, irritable colon, and mucous colitis. He concludes by saying that it is difficult to determine, in many instances, where functional changes end and organic changes begin, and quotes from Plato as follows: "For this is the error of our day in the treatment of the human body, that physicians separate the soul from the body."

In taking the history, which constitutes the first step toward making a diagnosis, the doctor usually first suspects that he is dealing with a functional

diseaser. The physician should allow the patient to recite his symptoms and tell his story in his own way without interruption. If the symptoms seem to indicate a functional condition simulating an organic disease one should assume that the organic disease is present until it can be ruled out. If, however, the patient's complaints do not suggest an organic disease the diagnosis of a functional condition may be made more readily and safely. In these cases the complaints may be any of the following: headache, tension in the suboccipital region, pain between the shoulder blades, shortness of breath, a sensation of constriction in the throat, epigastric distress and abdominal distention following meals, easy fatigability, and insomnia. An occasional patient will state that he thinks his trouble is caused by his "nerves," but most functional diseasers do not recognize the underlying basis of their symptoms.

After the physician has become suspicious that the illness is a functional one he should make a careful attempt to determine, if possible, what might be the cause of the disturbance. This step should not be omitted, although it is extremely time consuming, but may be left until later or be drawn out and amplified over a series of several visits if necessary. The doctor should inquire into the personal life of the patient, touching on such points as home life, economic status, marital status, interests, hobbies, religious activities, sex life, and ambitions. He should ask the patient about any worries that he might have or about any problems which are confronting him.

Occasionally the illness can be attributed to something as obvious as a mother-in-law in the home or the failure to be elected president of the lodge. Usually, however, the underlying cause is something much more serious such as poverty, frustrated desires, infidelity, either real or suspected, on the part of the marital partner, or fear of serious organic disease. Whatever the cause, it has direct bearing on the type of treatment to be administered and gives a fair idea of how successful that treatment is going to be.

The functional diseaser should be given a complete physical examination and submitted to such laboratory investigation as may seem indicated. The physical examination serves to impress upon the patient that his case is being considered with the proper amount of respect and prevents the doctor from missing an organic condition either coexisting or masquerading as a functional disease.

If the physical examination reveals no systemic abnormality the physician may safely assume that he is dealing with a functional disease, provided that the symptoms bear out the diagnosis. If, on the other hand, the physical examination does bring out physiological or anatomical derangement, these must be carefully evaluated as to their bearing on the patient's general condition. Just because a woman complains of nervousness and headaches and is found to have hemorrhoids one cannot jump to the conclusion that the rectal pathology is the cause of all her symptoms. The physical examination should be repeated from time to time, but not too frequently nor too many times. By these repetitions the physician is not placed in an embarrassing position by having his patient develop unrecognized organic pathology while undergoing treatment for a functional condition. However, the doctor who examines his patient completely too frequently may give the patient the idea that he is looking for something he can't find.

Laboratory work should be conducted as it would be in any case presenting itself for diagnosis. Just because an individual is a functional diseaser is no reason for making him the material for a technicians' field day. A complete blood count, urinalysis, and serological examination should be routine, but further tests need be made only as indicated by the presenting symptoms. The functional diseaser whose symptoms are mainly in his gastro-intestinal tract should have a gastric analysis, gastro-intestinal x-ray, and possibly a gall bladder visualization; the cardiac complainer should have an electrocardiogram; while the patient who suffers with his genito-urinary system should be subjected to a cystoscopic examination. Too much undirected laboratory work, rather than convincing the patient that he is being thoroughly gone over, is apt to make him fear that his disease has widespread ramifications.

Due to the rather indefinite nature of functional diseases, errors in diagnosis are easy to commit. To avoid making mistakes in diagnosis, which are at least embarrassing and may even be diasastrous, it is well to keep a few points in mind. Do not make a diagnosis of a functional condition by exclusion alone, but make it stand on the specific findings. If functional and organic diseases are present together be sure to recognize the fact and give attention to the more important one first. Do not rely upon snap judgment.

In functional diseases, as in many others, the therapeutic test is a valuable adjunct to diagnosis. When the functional diseaser goes to his doctor he is worried about himself, but so is the patient with cancer of the stomach who may have exactly the same symptoms, and bromides will make them both feel better. However, after a careful history, physical examination, and the necessary laboratory work have been completed without revealing organic pathology,

if the patient is given treatment to improve his mental state and this causes his symptoms to subside, one may be reasonably certain that a diagnosis of functional disease is correct.

Occasionally a patient with a serious organic disease is diagnosed as a functional diseaser. This happens just often enough to require a word of warning. Comroe[7], in a follow-up study of one hundred patients diagnosed as neuroses without important physical diagnosis, found the following facts. Forty per cent had reported definite improvement or symptomatic cure following hospital or dispensary care. In thirty-four per cent the condition had remained the same, while two per cent were worse. In twenty-four per cent definite evidence of organic disease had become manifest since discharge. In these the longest period of time elapsing was two years and the average was eight months. In seven cases death had occurred attributed to abdominal carcinomatosis, carcinoma of the liver, carcinoma of the stomach, coronary disease, Addison's disease, pellagra, and myocardial degeneration. Of the seventeen remaining cases the confirmed diagnoses were diabetes mellitus, three cases of gall bladder disease, duodenal ulcer, two cases of pulmonary tuberculosis, ureteral stone, chronic appendicitis, Buerger's disease, suppurative mesenteric adenitis, cardiovascular-renal disease with hypertension, renal calculus, uterine myoma, pregnancy, mitral stenosis, and toxic goiter. Examination of the previous records revealed symptoms which should have led to the proper diagnosis at the time of the original examination. As an extra safeguard, Wechsler[8] states that one should not make a diagnosis of hysteria or any other neurosis in a patient past forty years of age who has not previously presented outspoken neurotic tendencies.

The treatment of the functional diseaser is an individualized affair. There are certain general principles which guide therapy but the physician must approach each problem in a slightly different way. I shall confine myself to discussing general principles and leave their modification to the individual practitioners.

When the diagnosis has been established with reasonable certainty the patient should be told that his condition is a functional one. The doctor should tell him that, while definite and annoying, his symptoms are not being produced by organic disease. This statement should be made in such a convincing manner that no doubt of its truth can linger in the mind of the patient. Any suggestion that the illness is a trivial one must be avoided. In a general way the physician should explain the nature of functional disease and give a brief outline of what the treatment will be and what may be expected from it. Do not tell the patient that he is imagining his symptoms, and, above all, do not tell him to go home and forget his trouble; this he cannot and will not do.

Psychotherapy is the backbone of the treatment of the functional diseaser. It may not be exalted by such a name but all doctors employ it whether they know it or not. The term, however, should not be used when talking to a patient for he may associate it with serious mental disease and the institutional confinement which frequently goes with it. Psychotherapy should be applied casually, logically, and as frequently as the particular case demands. I have some functional diseasers who get along pretty well most of the time, but who occasionally retrogress and have to be taken in hand. After a session with one of these he will frequently say, "Doctor, I always feel so much better after I have talked to you." Psychotherapy is time consuming and consequently is apt to be slighted by the busy practitioner, but its importance cannot be overemphasized.

Obviously, psychotherapy can best be administered by a psychiatrist, but if every functional diseaser were to be sent to a psychiatrist there would not be enough psychiatrists to go around and the general practitioner would have to make most of his living out of obstetrics and pediatrics. I believe, although some probably disagree, that poor psychotherapy is better than none at all.

As was mentioned above, the physician should make an attempt to determine the underlying cause of the mental disturbance. Skillful questioning may be required to bring it out, and, occasionally, it never is definitely determined. If it is a deep emotion it will probably be either fear, anxiety, or shame; while, if more superficial, it may be worry about home conditions, health or finances. There are endless permutations and combinations of human emotions and any of these may be responsible for the functional diseaser's illness. Frequently, merely telling a patient that his condition is functional and not organic is sufficient to produce a cure. Usually, however, the emotional short circuit is of such long standing and is so firmly rooted that several sessions are necessary to unearth it before the problem of its disposition may even be begun.

As the second step in treatment the patient should have explained to him the relationship of his mental state to his bodily function. Most patients know that they react to conscious fear by rapid pulse, dilated pupils, and shallow respiration. These same people can be made to see that subconscious fear can cause similar disturbances of function, not so evident, perhaps, but nonetheless definite. They

know that when they are worried they sleep poorly and do not digest their food properly. By such analogies as these the doctor can convince his patient that all symptoms which the body experiences are not caused by cancer, angina pectoris, brain tumor, or other equally deadly organic conditions.

The most difficult phase of treatment is that in which the physician attempts to eliminate the cause of the patient's condition or to change his attitude toward it. Eliminating the cause may be as simple as assuring the patient that he does not have a cancer or as difficult as advising him to divorce his wife. Many times it is utterly impossible to eliminate the cause as in the case of a patient who is ill because he has lost his job and can't find another one. If the elimination of the cause presents too many obstacles the physician should make an effort to change the patient's attitude toward it. To tell a patient that it is desirable for him to take a philosophical view of poverty, an unfaithful spouse, or a frustrated desire to become an artist is one thing and to get him to do it is another. No rule-of-thumb may be set down by which this feat can be accomplished.

If the doctor is unable actively to influence his patient, he at least, can help him in a passive manner. This consists of encouraging the patient to get his troubles off his chest and is sometimes known as mental purgation. The understanding physician who lends a willing ear to the recitation of the patient's troubles frequently does about as much good as the man who, by logical reasoning, tries to change the patient's habits of thought. The individual who can tell his woes to someone derives as much benefit there-from as does the woman who has a good cry. Each means affords an emotional outlet which leaves at least some measure of contentment in its wake.

Drug therapy in functional conditions is necessary in almost all cases, but particularly in those where the illness is of long standing and where abnormal physiological patterns have been set up. Drugs, useful in this connection, fall into two classes; those which exert a general effect on the patient, and those which aim toward improving altered function. Medication in the latter group varies depending upon which organ system is the seat of the presenting symptoms, while drugs used in the former are fairly uniform for all types of functional conditions.

Before beginning drug therapy, the physician should carefully explain to the patient that he has a condition which medicine will not cure. He should then add that drugs can make the patient more comfortable while he is undergoing treatment but that they should be considered only as symptomatic measures, to be discarded as soon as possible. Probably the most useful drugs in functional diseases are the sedatives of which the bromides are, perhaps, the most widely used. Certain physicians have indicted their fellow practitioners on the grounds that they have produced widespread bromidism by the injudicious use of bromides in functional disorders. Such a warning, doubtless, has merit, but, considering the tremendous amount of bromide being used and the relatively few cases of bromide poisoning, I feel that its basis is more theoretical than real. However, bromides should be used cautiously for the functional diseaser is apt to be sick a long time. The other sedatives such as phenobarbital, veronal, and chloral hydrate may also be used to advantage, particularly in those people who develop intolerance to bromides.

Occasionally in treating the functional diseaser the physician finds it necessary to employ stimulants. This is rarely necessary, however, since these people are usually over stimulated in the beginning and need slowing down rather than speeding up. Their apparent exhaustion is due not to lack of stimulation but to depletion of their nervous energy caused by too prolonged natural stimulation.

In a general way the physician must make over the life of the functional diseaser if he is to be rendered symptom free or even symptom comfortable. The functional diseaser should be provided with a definite program for recreation either by means of a hobby or through some type of sport. He should be encouraged to regulate his habits in such a way that they fit in with the accepted views on mental and physical hygiene. This includes proper times for eating, sleeping, and bowel evacuation, as well as provision for periods of rest and relaxation during the day. The program should include return visits to the doctor from time to time. However, these should not be too regular or too frequent otherwise the patient will find himself leaning too heavily upon his physician for support.

A definitely useful adjunct to therapy in functional diseases is the use of the consultant, particularly the specialist. Even though the patient has the utmost confidence in his family doctor it is well to have the diagnosis substantiated by someone whose authority is recognized. This can be tactfully arranged and when the patient returns to the fold he is more receptive than ever to the words of wisdom of his attending physician.

The prognosis of a functional condition may be brought in advantageously as part of the treatment. The prognosis should be good but not enthusiastic. The patient should be told that his condition has been a long time developing, as usually it has, and

will take quite a while to cure. The patient becomes discouraged when a rapid cure fails to materialize as promised and feels that he is hopelessly incurable or that his physician is incompetent.

Regarding prognosis itself little can be said. The factors involved are too variable to make positive assertions possible. After considerable experience the shrewd physician will consider the type of patient, duration of the disease, underlying cause, and severity of symptoms before rendering a prognosis. Even then he will be wise to avoid embarrassment by making only guarded statements even to members of the patient's family. To have the most value, prognosis should be made only after the patient has been under treatment for some time and his response observed.

SUMMARY

The functional diseaser is that patient whose symptoms are produced as a result of disturbed mental or emotional equilibrium with or without organic pathology. He is found in greater numbers now than ever before due to our high speed civilization, economic uncertainties, and the impending shadow of war. He is usually a constitutionally inferior individual whose early training did not equip him adequately to meet the problems of life. His subconscious worry, anxiety, fear, or shame plague his mind until they are converted into physical symptoms to relieve the mental tension. The experienced physician usually recognizes the functional diseaser as he is recounting his symptoms, and is relatively certain of his diagnosis when physical findings and laboratory tests fail to show the presence of organic pathology. However, errors of diagnosis are not too uncommon and should be guarded against. The functional diseaser is treated mainly by psychotherapy with drugs playing a small and supporting part. The prognosis is variable and the physician who makes a positive one is asking for trouble.

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In Kansas, accidents are the second most important cause of death in men.—Kansas State Board of Health News-Letter.

MANAGEMENT OF THE MENOPAUSAL SYNDROME WITH STILBESTROL*

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In the last few years, the value of the steroid estrogenic hormones in the treatment of the menopausal syndrome and other allied conditions has been fully established and their usefulness demonstrated in vaginitis, both senile and juvenile, pruritus vulvae, migraine, chronic cystic mastitis, nausea and vomiting of pregnancy, amenorrhoea, dysmenorrhoea, hypoplasia of the uterus, and even atrophic rhinitis. The only drawbacks attending the clinical use of estrogenic hormones are the relatively high cost of potent preparations and the necessity of administering them by injection, since the oral route involves a high percentage of loss. In 1938 Dodds and his associates announced an orally potent, synthetic estrogenic substance called stilbestrol, and it has since then been subjected to extensive clinical trials in Europe and in American clinics. Stilbestrol is structurally quite different from the sterols. Chemically it is di-hydroxy diethyl-stilbene. Dodds and Lawson found that stilbestrol is several times more potent than estrone and at least as active as estradiol in biological tests. Mazer, Israel and Ravetz,[1] found the biologic potency, when given hypodermically, to be five times greater than estrone and equal to that of estradiol benzoate. Orally, it was necessary to give five times the amount of stilbestrol, in contrast to a ratio of 20:1 in terms of rat units for the natural estrogens. In other words, stilbestrol is twenty per cent effective when given by mouth, the natural estrogens only five per cent. This ratio applies to human beings as well as to experimental animals. As yet, there is considerable divergence of opinion regarding optimal dosage. For example, Novak[2] states that the dosage should be held at the lowest effective level and that it is rarely necessary to employ more than one mg. daily; while Weed[3] and his associates, of Tulane, recommend an initial dosage of at least one mg. three times daily. Geist and Salmon[4] used one to five mg. three times a week by injection and three to five mg. daily by mouth. In a series of thirty-eight menopausal cases, they report toxic effects in twenty per cent and state that headaches and nervousness were not strikingly relieved. Dunn[5] has treated young women suffering from pri-

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mary amenorrhoea with five mg. of stilbestrol daily for from fifty to sixty days. Von Haam and associates[6] in a series of 125 patients, used daily doses of from 0.2 mg. to 0.5 mg. orrally and 1.0 mg. parenterally twice weekly. In forty-two per cent of the patients some untoward symptoms appeared during the treatment. Mazer, Israel and Ravetz reported a series of 189 patients, with toxic reactions in fifty-two per cent receiving 2.0 mg. by injection every fourth day, in 21.3 per cent of patients taking 2.0 mg. orally and in only three per cent when the dose was 0.5 mg. daily by mouth or every fourth day by injection.

In most of the available literature there is no clear distinction between stilbestrol, the original substance designated diethylstilbestrol by Dodds et al, and the di-proprionate and di-acetate esters. There seems to be a sufficient degree of difference in toxicity and absorption to warrant this distinction.

SYMPTOMS

Stilbestrol and stilbestrol dipropionate were used in sixty-five cases of menopausal or premenopausal syndrome, two cases of amenorrhoea in young women, in two cases to suppress lactation, in one case each of senile vaginitis, premenstrual headaches and ovarian hypofunction. Three of the menopausal cases discontinued treatment and two others could not be followed up, so that the statistics quoted here apply to sixty cases, except for the summary on toxic reactions in which all cases have been included.

The order of frequency of symptoms corresponds rather closely with the symptoms tabulated by Hawkinson[7] in a series of 1000 cases, with one exception, headaches and occipito-cervical aching were complained of relatively more often in this series and rose in order of frequency to sixth and seventh place.

In addition, vaginitis was present in eleven cases or eighteen per cent. An interesting observation was that the trochanteric fat pads usually associated with ovarian deficiency were observed in every one of these cases. The average age of patients was 45.35 years, the youngest twenty-seven, and the oldest sixty-five years.

When a patient complaining of menopausal symptoms is first seen, a careful history should be taken, a complete physical and pelvic examination made and laboratory tests done in order to rule out anemia, cardiorenal or cardiovascular disease, hypertension and thyroid conditions. In these patients, the physician has a great opportunity to practice preventive medicine with respect to malignancy of the generative organs. The chance to correct predisposing conditions, such as cervical erosions and infections, should always be kept in mind. Biopsy of suspicious cervical lesions is always indicated before actual therapy is begun.

In treating the menopausal patient, the general practitioner should familiarize himself with the vaginal smear method first described by Papanicolaou and Shorr and later simplified by Geist and Salmon.[8] The technique is very simple. A speculum is inserted into the vagina and the vaginal mucous membrane and cervix inspected for evidence of infection or other abnormalities. On withdrawing the speculum, there will be almost invariably a small amount of vaginal secretion on the posterior blade of the speculum sufficient to make a smear. This secretion is diluted with a little saline, spread on a glass slide, and dried in the air. It may be stained with fuchsin, but methylene blue will do almost equally as well. Diagnosis of estrogen deficiency depends on the type of cells observed in the smear.

ORDER OF FREQUENCY OF SYMPTOMS

Zimmer	Hawkinson
1. Nervousness (ninety-three per cent)	1. Nervousness, subjective
2. Fatigue and lassitude (eighty per cent)	2. Menstrual disturbances
3. Flushes or chills (seventy-eight per cent)	3. Flushes and chills
4. Menstrual disturbances (sixty-eight per cent)	4. Excitability
5. Excitability (sixty-seven per cent)	5. Fatigability and lassitude
6. Headaches (sixty-one per cent)	6. Depression and crying
7. Occipito-cervical aching (sixty per cent)	7. Irritability
8. Disturbed sleep (forty-eight per cent)	8. Disturbed sleep
9. Depression and crying (forty-six per cent)	9. Tachycardia, palpitation, dyspnea
10. Irritability (for per cent)	10. Vertigo, scotomas
11. Vertigo (thirty-six per cent)	11. Decreased memory and concentration
12. Tachycardia and palpitation (thirty-five per cent)	12. Headaches
13. Rheumatic and other vague pains (twenty per cent)	13. Frigidity
14. Nausea (twenty-five per cent)	14. Numbness and tingling
15. Abdominal distension (twenty-three per cent)	15. Occipito-cervical aching
16. Numbness and tingling (twenty-one per cent)	16. Vague and indefinite pains
17. Decreased memory and concentration (fifteen per cent)	17. Excessive sweating
18. Frigidity (eleven per cent)	18. Formication
19. Excessive sweating (ten per cent)	
20. Formication (ten per cent)	

When the supply of estrogenic hormone is inadequate, the vaginal epithelium atrophies and tends to lose its layer of cornified cells, the amount of glycogen in the cells becomes diminished, and the degree of acidity is lowered. With the progress of atrophy continuing, more and more atrophy cells (or "deep cells," small round cells with deeply staining nuclei) and leucocytes are found in the vaginal debris instead of the large keratinized squamous cells with deeply staining, pyknotic nuclei which characterize smears from the healthy vagina.

On the basis of the cells present in the vaginal smear, classification into four groups is usually made, from three plus deficiency to no deficiency.

Three plus, or advanced estrogen deficiency is characterized by complete absence of squamous epithelial cells and the presence of small, round or oval epithelial cells with rather large, darkly staining nuclei (atrophy cells). These are the cells which Pananicolaou and Shorr have described as "deep cells." Leucocytes and erythrocytes are present in varying numbers.

In two plus, or moderate degree of estrogen deficiency, there is a variable number of large, epithelial cells, many of which are irregular in shape. The nuclei are relatively large. Interspersed among these cells is a varying number of "atrophy cells" and leucocytes. The relative proportion of the large epithelial cells to the "atrophy cells" is variable, but both are present.

In one plus, or slight deficiency, rather large irregular epithelial cells predominate. The cells vary in size and shape, their edges are somewhat irregular and frequently indistinct in outline. They frequently occur in clumps; a few "atrophy cells" may be present.

Where there is no deficiency ,the smear consists of large, flat, clearly outlined, squamous epithelial cells with small, deeply staining nuclei. These cells are larger, more clear cut and the nuclei relatively smaller. No "atrophy cells" and usually few leucocytes are seen.

Estimation of the hydrogen ion concentration of vaginal secretion is also said to be helpful. The normal value is about 4.5, but in the presence of estrogen deficiency, rises to 7.0 or above. However, this method was found to be very unreliable and in this series did not parallel the vaginal smears. Some of the most advanced deficiency cases had a normal vaginal pH.

DOSAGE

Mazer and his associates have shown that as little as 0.2 mg. of stilbestrol given daily to a castrated woman maintains a level of estrogen excretion comparable to that occurring in a normal woman during the week prior to menstruation. Theoretically, at least, some women should be benefitted with less than this amount and in this series, doses from one-eighth to one-fourth mg. daily by mouth were quite adequate in a number of cases. Doses of one-fourth to one-half mg. were used in the majority of cases receiving the drug by mouth, and one-half to one mg. every five to seven days in those patients receiving stilbestrol by intramuscular injection.

On three occasions, 5.0 mg. were given by injection, otherwise the highest dosage used was 1.0 mg. by mouth, and 2.5 mg. by injection.

These dosages are much lower than those formerly recommended in the literature, with the exception of the most recent articles mentioned above and yet the clinical results are at least as good.

Twenty-three of our patients received injections alone, twenty injections and tablets and seventeen tablets alone. The optimal dosage was ultimately determined by trial and error. It is probably best to start with the smaller doses and increase until a satisfactory response is obtained and the patient's tolerance to the drug is ascertained.

Patients should be told early in the course of treatment, that in order to obtain the best results, they should continue after symptoms have been relieved, since insufficient treatment is likely to be followed by the recurrence of symptoms.

Results were classified as very good in twenty cases, (thirty-three per cent); good in thirty cases, (fifty per cent); a total of eighty-four per cent good results. Moderate or slight improvement occurred in an additional seven cases, (twelve per cent); and in three cases, (five per cent) no results were obtained.

Symptoms generally improved within two weeks after treatment was begun. Several patients who had been receiving estrone previously, noticed the change and felt greater improvement when taking stilbestrol. Some had an aversion to injections, almost to the point of phobia, and were very grateful for the relief obtained from adequate oral medication.

Three patients, who had suffered from migraine type headaches for many years, obtained greater relief than they had ever experienced before. However, one of these had recurrence of symptoms one month after stilbestrol dipropionate was discontinued, the other two are still taking the drug by mouth.

Besides the menopausal cases, there was one case of premenstrual headache which was relieved, and one case of senile vaginitis without other symptoms treated by injections with good results. Two or three injections of 1.0 mg. stilbestrol dipropionate sufficed to suppress lactation in two postpartum

cases. In two cases of primary amenorrhoea in young women, 3.0 mg. and 4.5 mg. stilbestrol dipropionate, respectively, administered in three divided doses by injection, resulted in the production of a normal period.

In three cases, subcutaneous implantation of crystalline stilbestrol was tried. Twombly and Millen[9] report very satisfactory results using intramuscular implants of one or more 20.0 mg. pellets of estradiol. These were inserted through a trocar, size ten French, into the gluteal muscles. These investigators state that the effect of estradiol in pellet form surpasses other forms of therapy and that relief lasted five or six months after a single implantation. Stilbestrol dipropionate is as yet not available in pellet form and in the three cases in this series from 30.0 mg. to 50.0 mg. crystalline stilbestrol was implanted through a small skin incision on the lower abdomen. All three cases had considerable nausea, headaches and griping abdominal pain for from four to six days after implantation, but thereafter felt remarkably well. Relief lasted one month, two months, and four months respectively. In all cases, there was some delayed wound healing, probably due to local toxic effect, with some loss of part of the material introduced. All three patients were sufficiently pleased with the results to volunteer for further experiments when the solid pellets become available for clinical trial. It seems quite possible that after this method of administration has had sufficient experimental and clinical study it may become the method of choice in the future.

There have been a number of reports of success in treatment of arthritis in the menopause with estrogenic substances, but no sound explanation of the mode of action has been given. Five of the sixty cases here reported had coexisting arthritis or neuralgia, and following stilbestrol treatment felt greatly improved. Since these disorders are usually considered to be due to focal infections, it is possible to explain the beneficial effect of stilbestrol if the vaginitis is considered to be the source of infection in these cases. Improvement then is due to the change from a pathological bacterial flora in the vagina to a normal flora which usually follows in the wake of histological changes and the disappearance of leucocytes from the vaginal smear.

TOXICITY

The available reports on the toxicity of stilbestrol are so discordant that it is hard to formulate a definite opinion. However, three more recent articles by Freed,[10] Von Haam and Mazer and their associates, emphasize that the doses recommended previously in the literature have been excessive. Doses up to twenty times the effective therapeutic dose used in this country have been reported from Europe, with incidence of toxic reactions as high as eighty-seven per cent. Another point which has not been made clear, heretofore, is the difference between stilbestrol and stilbestrol dipropionate. Most European reports seem to deal with stilbestrol alone, yet the dipropionate ester is only one-seventh as toxic as stilbestrol, as will be shown later.

Undesirable side-effects may be classified into two groups, physiologic and toxic. Into the first group fall such effects as proliferation and activation of mammary glands with painful swelling of breasts, vaginal bleeding after cessation of menses (so called withdrawal bleeding to distinguish it from true menstruation) and excessive flow in patients who are still menstruating.

The toxic symptoms are predominantly gastro intestinal; i.e., nausea, vomiting, abdominal pain and griping and even diarrhoea. Headaches and vertigo are sometimes encountered and occasionally skin eruptions (Shorr, Robinson and Papanicolaou). The reason Geist and Salmon found no striking relief of headaches in their series, may be that by using doses of 3.0 mg. to 5.0 mg. daily, toxic headaches at once superseded the original complaint. Although these symptoms are quite disagreeable, they are not in any way seriously harmful and disappear promptly after medication is stopped, or the dose is reduced.

In the series reported here, tender and enlarged breasts were encountered twice. Vaginal bleeding occurred in two cases (five years after the last menstruation) and in one case, was rather severe, but required no corrective measures. One woman, who was still menstruating, had such excessive flow that several injections of testosterone propionate had to be given.

Toxic reactions were slight or fleeting nausea, severe nausea and vomiting, abdominal pain and griping, headaches and vertigo. Seven out of nineteen patients receiving stilbestrol had some sort of reactions, mild or severe, and two discontinued treatment. Three of the remaining five patients had no reaction on similar doses of stilbestrol dipropionate. Thirty-seven per cent of stilbestrol treated patients exhibited side effects of some nature.

One out of sixty-nine patients receiving stilbestrol dipropionate discontinued treatment, two had mild nausea and cramps, one moderate nausea after oral administration, but not after injections, making a total of 4.5 per cent reactions in patients treated wih stilbestrol dipropionate.

Thus there is a marked difference in the incidence of toxic reactions between stilbestrol and stilbestrol dipropionate.

There is no clinical or experimental evidence that stilbestrol or related substances cause tissue damage when used therapeutically, even when dosages much larger than ordinarily used are employed. Dunn reports one case in which the administration of 480.0 mg. produced no signs of toxic effects. Freed and his associates checked the alleged hepatotoxic action of stilbestrol with the bromsulphalein retention tests and found that in not a single instance was the bromsulphalein retention greater after stilbestrol treatment than before. Furthermore, relatively huge doses did not cause pathologic changes of liver or kidneys in rats. Von Haam and associates draw the same conclusions in a recent article. Mazer, Israel, and Ravetz made exhaustive laboratory studies on ten patients receiving as much as 825.0 mg. of stilbestrol over a period of as much as one year. The tests carried out on these patients were: B.M.R., blood counts, bleeding and coagulation time, hippuric acid excretion, urinalysis, alkali reserve, blood sugar, urea nitrogen, creatinine, blood uric acid, blood cholesterol, calcium, chloride, phosphorous, total protein, albumin and globulin. The results showed no significant alterations.

In rats and rabbits the daily injection of 0.5 mg. per kilogram for a period of forty-two days produced cloudy swelling in liver, kidneys and spleen. This dose corresponds to a daily dose of about 30.0 mg. by injection in the human being, which is more than 100 times the usual therapeutic dose. It must be remembered that the natural estrogens also produce tissue damage in experimental animals when given in comparable doses.

The same investigators found that stilbestrol, like the natural estrogens, markedly reduce the insulin requirement of diabetic patients through inhibition of the diabetogenic hormone of the anterior pituitary. In this connection it may be said that there seems to be a qualitative difference in the inhibiting effect on the individual hormones of the anterior pituitary. Whereas, the inhibition of the anterior pituitary gonadotropic hormone is most marked, Noble found that it was more difficult to inhibit growth in young rats.

The alleged carcinogenic action of stilbestrol should be mentioned briefly. This same question has been raised before, after it was found that the natural estrogens could produce cancer of the breast in a susceptible strain of mice. Yet there has never been a single case reported of cancer which could be attributed to estrogenic therapy. In this series there was one woman previously operated on for carcinoma. She did not show any evidence of reactivation of the tumor.

CONCLUSION

Stilbestrol and stilbestrol dipropionate* have a definite place in the treatment of menopausal disturbances and other estrogen deficiency states. Ease of administration and economic advantages make these drugs an outstanding contribution to our therapeutic armamentarium. Toxic reactions are occasionally encountered and are much more frequent after stilbestrol than after stilbestrol dipropionate. They are annoying, but harmless, and certainly of no importance when compared to the side-effects occasionally following the use of sulfonamide drugs. There seems to be no valid reason for withholding the drug any longer from general use.

SUMMARY

Ever since the value of the steroid estrogenic hormones in the treatment of the menopausal syndrome and other allied conditions has been established, clinicians and biochemists have been searching for an effective synthetic product which would give equally good results when administered orally. Stilbestrol, synthetized by Dodds in 1938, has been used extensively in Europe, but to a lesser degree in this country, because of its reported toxicity and undesirable side effects. Available reports show a divergence of opinion in regard to toxic effects as well as therapeutic doses used. This study aims to contribute to the clinical data and evaluation of stilbestrol. The drug was administered altogether to seventy-two patients. Results are reported on sixty of sixty-five patients with menopausal or premenopausal syndrome and a few cases of other conditions. Results are good in a majority of cases and in this series toxic side effects were encountered less often than reported in the literature. In general, stilbestrol is more apt to cause untoward side actions than stilbestrol dipropionate after either intramuscular or oral administration. Symptoms encountered in this series are tabulated as to frequency and compared with those of other reports. Diagnosis was usually confirmed by the vaginal smear method of Papanicolaou. The hydrogen ion concentration of the vaginal secretion was found to be unreliable and frequently did not correspond to degree of estrogen deficiency present.

A number of patients who had been treated with natural estrogens before, noticed the substitution, and some of these remarked about the improved results under stilbestrol therapy. Doses employed were generally smaller than those reported in the

*Acknowledgment: The Stilbestrol preparations used in this study were furnished by the Department of Medical Research of the Winthrop Chemical Company, Inc., and this material assistance is hereby gratefully acknowledged.

current literature which probably accounts for the smaller incidence of untoward side effects.

In one case vaginal bleeding reached alarming proportions but subsided after discontinuance of the drug. In one other case testosterone propionate was used to check the excessive flow. Incidence of other toxic manifestations is discussed and the recent literature pertaining to them is reviewed. No bad effect was noticed in one patient previously operated for carcinoma. Subcutaneous implantation of crystalline stilbestrol was tried in only three cases and although the results were not particularly impressive, this method may come into greater use in the future. The clinical observations in this series corroborate conclusions of Mazer and his associates as well as others, that stilbestrol is a highly active estrogenic substance and may be safely administered if the therapeutic dosage is not exceeded. Toxic reactions are relatively unimportant and certainly not as serious as those encountered following use of the sulfonamide drugs in infections. Because of the ease of administration and economic advantages it is hoped that stilbestrol will soon be officially recognized and made available for general use.

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Although the problems of military field sanitation are important and complicated, "they are less serious and less difficult to solve than are some of those created by contact between the troops and the civilian population," W. A. Hardenbergh, Colonel, Sanitary Corps, United States Army, Washington, D. C., declares in the July-August issue of War Medicine, published bimonthly by the American Medical Association, Chicago, in cooperation with the Division of Medical Sciences of the National Research Council, Washington.

For the solution of these problems, Col. Hardenbergh says, "efficient local and state health departments are needed, with the fullest and most sympathetic cooperation given and received at all times. The present arrangements contemplate such cooperation, with an officer of the United States Public Health Service acting as liaison officer, in order that the fullest possible health protection can be obtained by the joint action of all agencies engaged in health work."

IRON DEFICIENCY ANEMIA*

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The problem of iron deficiency anemia is not a new one. Its history is old and most interesting. Chlorosis, one example of iron deficiency, first appeared in the sixteenth century and was wide-spread in Europe. Since then it has disappeared quite suddenly several times only to reappear later. Richard Cabot tells of its passing from the wards of the Massachusetts General Hospital at the turn of the last century. This observation was also made by many others in England, Germany and Scandinavia.

The medical profession can claim no credit in first describing the disease. This was done by one of the finest clinical instruments, the mother's eye. The high born ladies of the old Netherlands watched their marriageable daughters droop and their cheeks fade, even though their hearts beat vigorously behind their iron corsets. These ladies called their daughters' malady the green sickness or the love sickness, though fever rarely accompanied it. The first medical description must be credited to Pieter van Forest in 1546 and Johannes Lange in 1589. In chlorosis, as was also the case with syphilis, another disease widely spread at this time, the remedy was quickly found. Who it was that deserves this credit is not known to us.

Sydenham and Willis, in the seventeenth century, described the efficacy of iron treatment in chlorosis. In 1746, Menghini placed the use of iron on a sound basis by showing that this element is a normal constituent of the blood and that it is found in the protein fraction. The splendid paper by Heath and Patek in 1937 did a great deal to clarify some of the problems of iron deficiency[1].

An iron deficiency anemia is one in which the concentration of hemoglobin in the erythrocytes is less than normal or the amount of hemoglobin per cell is less than normal. The red cells are hypochromic and generally microcytic.

The types of anemia recognized as due to iron deficiency are:

1. Hypochromic or nutritional anemia of infancy and childhood.
2. Chlorosis or the hypochromic anemia of girls.
3. Hypochromic anemia of pregnancy.
4. Hypochromic anemia of blood loss.
5. Idiopathic hypochromic anemia, or Plummer-Vinson Syndrome[1a].

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These anemias occurring at different ages and under varying physiological and pathological conditions are all due to the same essential cause, namely iron deficiency, either from lack of iron as in the breast fed infant or loss of iron due to hemorrhage. This concept has done much to make for better understanding of these anemias and bring health to those who did not know what it was to feel well.

IRON METABOLISM AND REQUIREMENTS

Comparatively little is known of the chemistry and formation of hemoglobin, but research has made some facts known to us. Hemoglobin is a protein composed of two molecules. The large molecule, globin, is linked with the smaller iron-containing molecule, hematin. The body is able to furnish all the factors necessary for the formation of hemoglobin under normal conditions. It is now thought that the pyrroles, which form an essential part of hematin, can be synthesized by the body. However, when a demand for extra iron is made, it must be met either from stores laid down in the body or from sources outside the body. If these demands are not met, the inevitable result is iron deficiency anemia.

Iron is present in the body in very small amounts even though it is found in all the cells and is most important. There are about 2.7gms. of iron circulating in the blood as hemoglobin iron, about 0.3 gms. as functioning tissue iron, and approximately 1.3 gms. as stored iron for emergencies. This gives a total of 4.3 gms. of iron in the body[1b].

An erythrocyte with a normal volume of ninety cubic microns contains about thirty micromicrograms of hemoglobin. Thus one-third of the normal cell mass is hemoglobin. This is full saturation of the stroma as is shown by the fact that this concentration is never higher. Haden states that approximately 100 milligrams of iron are needed for the trillion erythrocytes which must be formed each day to keep the blood in equilibrium. About eighty-five milligrams of this comes from iron set free by the death of red cells. Most food contains only minute amounts of iron, so that the margin of balance is small on an average diet. During growth, pregnancy and lactation additional amounts of iron are needed[2]. The average person may lose half his blood by hemorrhage and restore the normal blood picture by calling on the body's iron reserve. This may be done only once. Further hemorrhage will cause an iron deficiency anemia to develop. Tacitus describes the case of Paulina, wife of Seneca, in whom a single hemorrhage resulted in an anemia lasting the rest of her life.

The absorption of iron takes place largely in the duodenum, the metal being in the ferrous state. The absorption of iron is greatly influenced by the amount of HCl excreted by the stomach. Achlorhydria disrupts the absorption of iron. There are probably other factors entering this process, but their action is not proved. There is much work that suggests that the stomach secretes some other substance than HCl which influences absorption. Thus because of the above factors, intake may be sufficient, but absorption may not. Finally, iron may reach the bone marrow in satisfactory amounts but not be utilized. Many factors interfere in the integration of iron into hemoglobin. Lead poisoning is associated with a hypochromic microcytic anemia. Nephritis, also, exercises a like interference with iron utilization. Myxedema, severe infection, and probably nutritional imbalance associated with vitamin B and C deficiency are responsible for many failures in treatment.

Late work in the metabolism of iron by Fowler and Barer[3], Brock and Hunter[4], and Reimann et al[5], shows that iron is a "one way" metal, that is, it can enter the body but it cannot be excreted in significant amounts, without blood loss. Thus we can disregard loss of iron from the body except by hemorrhage or chronic blood loss. In the etiology of iron deficiency anemia we have only to consider the intake of iron in the food, the loss of iron by bleeding, and the demands of the body for iron during growth and pregnancy.

PREVALENCE

With these thoughts in mind, we should expect to find iron deficiency a common condition, and indeed it is. Abbott and Ahmann found in Florida that of 883 rural school children examined, fifty per cent were definitely anemic and thirty-one per cent showed border line anemia[6]. Iron deficiency anemia was found in sixteen per cent of the women admitted to the medical wards of Boston City Hospital. In an excellent survey in Scotland by Fullerton, Davidson, and Campbell, iron deficiency anemia was found in thirty-two to forty-one per cent of the children, sixteen per cent of the adolescent girls, and forty-five per cent of the adult women. Mackay[7] reported that more than two-thirds of London women of the hospital class showed anemia, and largely due to iron deficiency in her opinion. This condition may occur where ever there is malnutri tion and may follow any acute hemorrhage or chronic blood loss.

CLINICAL TYPES

The types of iron deficiency anemia merit some individual attention.

1. The hypochromic anemia of infancy and childhood is primarily caused by the excessive demand

for iron needed in growth. Contributing factors are inadequate iron endowment from the mother, prematurity or multiple births, in which iron reserves may be small, the iron-poor diet of the breast fed, sickness with resultant poor appetite, and gastro-intestinal disturbances and achlorhydria interfering with iron absorption.

2. Chlorosis is now a rare condition. Most of us here have never seen a typical case. It is regrettable that its true nature has not been determined, but this will be accomplished if it reappears. It is not generally thought, now at least, that chlorosis was due to living in garrets, tight lacing and the reading of unhealthy literature. Poor hygienic and eating habits were responsible, however, for many cases. Mild anemia is very common in girls after puberty and it responds readily to iron therapy. In these young girls, early and abnormal menstruation, rapid growth and achlorhydria are the most important factors. If there is no excessive menstruation, search for blood in the gastro-intestinal tract and elsewhere should be carried out.

3. Hypochromic anemia of pregnancy is a common finding. In any normal pregnancy there is a reduction in hemoglobin. This is due to an increase in the circulating plasma and is called a true physiological anemia by many. This normal reduction in hemoglobin is about ten per cent. In pregnancy there is often a decrease in gastric secretion and an iron deficient diet is almost the rule. The fetal demands for iron are partly met by the absence of menstruation. A hemoglobin between fifty to sixty per cent is an indication that the woman was anemic before her pregnancy or that infection, toxemia of pregnancy or blood loss is present.

4. The hypochromic anemia of blood loss is self-explanatory. So far as our subject is concerned, to bleed means to lose iron. If the bleeding stops and the iron supplies are adequate, the hemoglobin will return to normal without outside iron. If the bleeding continues and the iron reserves are depleted, the anemia will develop rapidly even though the blood loss seems insignificant. If the blood loss is now stopped, the anemia will persist because the materials needed to manufacture hemoglobin are lacking in part. The anemia will persist until the intake of iron is adequate. It is important to remember that no iron is lost in hemorrhagic effusion; the blood is broken down and the iron is returned to the body stores. Gastro-intestinal and uterine hemorrhages account for most of the severe anemias in this group, and on a world-wide basis, hookworm infestation is the most common cause.

5. Idiopathic hypochromic anemia[8] is a most interesting clinical picture. There are findings in this condition usually lacking in the other types of iron deficiency. The patient is a woman of middle life with mousy hair and pigmentation of the neck and chest. Beside the usual signs and symptoms of anemia, there are marked epithelial changes in the pharyngeal mucosa, the tongue is denuded of papillae and often sore. Painful fissures are often present in the corners of the mouth. Achlorhydria and atrophy of the gastric mucosa are the rule. The finger nails are characteristically brittle and flat. They may be spoon-shaped, which finding is regarded as diagnostic by many. The term idiopathic is still used by many because often there has not been or does not seem to be any blood loss. Mild splenomegaly is present in about sixty per cent of the cases. Heath and Patek list the etiology in sixty cases as follows[9]:

	Per Cent
Deficient in iron	62
Achlorhydria	75
More than four pregnancies	47
Pathological blood loss	88
Menorrhagia	62
Hemorrhoids	23
Epistaxis	15
Other sources	15

DIAGNOSIS

Any anemia with a low color index, normal to low normal leucocyte count, with erythrocytes microcytic in size and hypochromic in color with no obvious cause for anemia, as uremia or severe infection, is probably an iron deficiency anemia. A color index alone of 0.6 or less certainly indicates iron deficiency. Generally close questioning will reveal some type of blood loss as from a peptic ulcer, from the uterus, rectum or excessive menstruation. To often to be disregarded, this type of anemia may be the only finding of a right sided intestinal carcinoma. Frequently it is far more important to correct or alleviate the lesion causing the blood loss than it is to treat the anemia.

TREATMENT

When a complete diagnosis has been made, treatment may be started. A complete diagnosis does not mean a diagnosis of iron deficiency alone, but an understanding of how the iron deficiency developed as well. It is imperative that each case be fully investigated before treatment is instituted, for a satisfactory response to iron may produce a false sense of security in the medical attendant in the presence of cancer or some other condition which may prove fatal. Here the test for occult blood in the feces comes into its own for it may be the only way the blood loss may be detected.

The main indications in treatment are two: First, to arrest the blood loss if possible; second, to replenish the patient's iron stores.

It should be remembered that twenty-five milligrams of iron are needed to produce a rise of one per cent in hemoglobin, so if five milligrams are absorbed and utilized per day, it will take five days for the hemoglobin to rise one per cent, and fifty days to rise ten per cent[c]. Therefore many months may be needed for treatment of severe iron deficiencies. When there is achlorhydria, the use of dilute HCl may mean the difference between success and failure. In uncomplicated cases, adequate dosage of inorganic iron by mouth will result in a rise of one per cent and occasionally three per cent per day.

Patients with a hemoglobin below sixty-five per cent should be in bed, for it is in this group that there is a high percentage of refractory cases. The prophylactic use of iron in the pregnant woman is recommended because of its beneficial effect on the mother and offspring.

The minimal oral effective dose of any iron preparation has been defined as the dosage necessary to cure the great majority of cases. This means of assay is not satisfactory but it is the only one available. There is general agreement that the bivalent ferrous salts are more effective than the trivalent ferric salts. However, that a sufficient amount of iron is given is more important than the form in which it is administered. The parenteral use of iron is seldom justified as the therapeutic dose is so close to the toxic dose. Twenty-five milligrams may cause nausea.

COMMON PREPARATIONS IN USE

Ferric and ammonium citrate, six gms. daily, is given in capsules, aqueous solutions or syrups. In solutions the teeth must be protected by the use of a drinking tube.

Reduced iron, three gms. daily, is less effective therapeutically, but the actual dose is smaller in bulk and gastro-intestinal symptoms are uncommon.

Ferrous carbonate, four gms. daily, is given in 0.3 gm. pills and should be freshly prepared because oxidation to an insoluble form may occur.

Ferrous sulphate, one gm. daily, is given in pills. It may cause gastric irritation.

Ferrous chloride, 0.5 gm. daily, which gives a high percentage of retention and utilization, may be given in capsules or as a simple syrup.

Now one final word as to treatment. Do not let any one tell you that he cannot take iron, that merely means that he will not. If the usual dose of iron does not give results, double the dose. Enteric coated tablets may save the patient some discomfort.

Some of the pharmaceutical houses are enjoying splendid business from the sale of anemia remedies which they feel will benefit any anemia, either nutritional, iron deficiency or pernicious. The great majority of such preparations are shot gun mixtures of two or more ingredients. More than one hundred preparations of this type have been advertised to the medical profession in the last few years, many of them are "best sellers," and the gross sales of one is reputed to be around three million dollars a year.

In most of these preparations the ingredients are doubtless therapeutically active and if given in a large enough dose to supply a sufficient quantity of the particular material needed will yield satisfactory results. The huge volume of these preparations consumed is less a tribute to their potency than to the clever way in which they have been advertised and promoted. They direct appeal to those physicians who can not make blood examinations themselves and are unwilling to refer patients to others for this purpose. A circular advertising one such preparation states that it is designed for the oral administration of all types of anemia which respond to liver therapy or the use of iron salts. Capital is made of any statements in the literature about the advantages of these products. Liver never helped an iron deficiency other than by its high iron content, and there is no doubt that iron is ineffective in the treatment of pernicious anemia. Treatment, therefore, will be more effective and less expensive if a definite diagnosis of the anemia is made[10].

SUMMARY

1. An effort has been made to demonstrate that iron deficiency anemias are due to nutritional demands in the young, and due to blood loss, past or present, in the adult.

2. Inability to explain an iron deficiency is a reflection on our thoroughness and should act as a spur to our diagnostic zeal. Any patient whose erythrocyte count and hemoglobin have been restored to normal by the use of iron, only to fall again after treatment is stopped, is still bleeding. This blood loss must be located.

3. Some therapeutic suggestions have been made.

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DENTISTRY AS IT PERTAINS TO MEDICINE*

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This paper will attempt to restore the mouth to the human body from which it was virtually separated one hundred years ago. In order to do this we should, perhaps, look back across the pages of dental history and review, briefly, the steps that have led up to the present status of dentistry as a branch of the healing art. In 1630 American dentistry had its birth when the Massachusetts colony brought in three barber-surgeons who provided the only dental service available to the colonists. There is no further record of dentistry in this country until 1735 when a man by the name of Mills, a wig maker in New York advertised to extract teeth. From then to the opening of the nineteen century, many men came from Europe who were more or less skilled in the art of dentistry as it was practiced then. The first dental school was the Baltimore College of Dental Surgery established in 1840, which I had the pleasure of visiting last September. In August of 1834, the first dental society was formed in New York. The American Society of Dental Surgeons, which is the present American Dental Association was organized in 1840. Within this period of less than six years—1834 to 1840—dental organization, dental journalism and dental education all had their origin. On this foundation, dentistry began the building of a profession which, last year, celebrated its 100th anniversary.

I shall not take the time to recite the accomplishments of American dentistry since those early days a hundred years ago. You are all more or less familiar with them. Instead let me call your attention briefly to some of the unfinished tasks of the present and those also that are bound to present themselves in the future. The first thing that impresses me as I look back over 100 years of American dentistry is that dental ills have not been materially reduced. They are still almost universal. We have not, with all our boasted progress, learned their cause or how they can be prevented. This is not to be taken as a reflection on the profession. The same is true in the medical profession. After spending millions of dollars, the causes of cancer and common colds still remain a mystery.

This brings to my mind the subject of research. Some way must be found to check dental disorders at their source before anything approaching complete success can be hoped for. The problem of dental care for all the people can never be solved by present methods of dental practice. Dental diseases differ from other ills in that they create conditions that are, to a certain extent irreparable. Teeth and the tissues which support them do not possess the power of self-repair. This means that early detection of dental disease is of supreme importance in its control. You as medical men can do a great deal toward solving this problem by helping us to a greater cooperation on the part of the public.

I have said that if we are ever to achieve prevention, then a way must be found to check dental disease at its source. This can only be done by a long range program of research, and since all research in dentistry as in medicine, is carried on in the interest of the public, it is the public that should support it. This it has not done for dental research. Millions of dollars have been spent for related fields of medicine with almost no part of it given for research in dentistry. The A. D. A. has expended a great deal of money for research, most of which has been contributed by the profession itself. On this particular point I was interested in a recent editorial in one of our larger newspapers. The editor had this to say and I quote, "If teeth are guilty of all the evils charged against them, why aren't dentists equipped to find the cause and get rid of it?" "The answer is," and I'm still quoting, "that dental schools are not endowed or equipped for postgraduate and research work. They are the neglected stepchildren of science. Even the instructors for the most part practice on the side to get a living. Brilliant young men who need backing for cancer research usually find it, but who will support one who wishes to spend his life discovering the mysteries of teeth? It is a queer civilization that endows dog hospitals and will not spare the money to discover why bad teeth cripple its people." I bring this phase of the subject to your mind to arouse in you an interest in the betterment of dentistry as a health measure for all the people. Let me emphasize another part which you as medical men can take in connection with the source of dental disorders. You should realize that you are responsible, in large measure, for dental disease. You are the ones who are responsible for the care and feeding of the pregnant women and the small children. A great many dental troubles are started before birth and in early childhood, when mothers and children are entirely under medical supervision. If the prospective mother is brought by the physician to realize, both for her own general health and that of her child, the necessity for dental care, there will be a far better chance of elimination, at the source,

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the most common cause of dental disease. There is absolutely no truth in the proverbial saying "Every child costs the mother a tooth." The chances for our children having healthy teeth are much better than they used to be if necessary precautions are taken.

The physician should see to it that the expectant mother consult her dentist regularly and also that she is supplied with sufficient materials to build good teeth. About ten per cent above her normal need is usually sufficient.

In the care of the child after birth the physician should instruct the mother to have the child taken to the dentist at frequent intervals while the deciduous teeth are erupting. There is usually not much to be done, but it does give the dentist a chance to gain the confidence of the child and the parents which is valuable later when work does have to be done.

Let me say, from a dental standpoint, that neglect to give proper instructions in prenatal and postnatal care is definitely a shortcoming on the part of medical men. Dentists do not, as a rule, come into the picture until the damage is done and the patient is well on the way to becoming a dental cripple.

Please do not misunderstand these remarks and interpret them as an attack on the medical profession. They are intended as a plea for fuller cooperation that the public may be better served.

If the physician brings the child this far along then the dentist should assume the responsibility for the proper care and development of the teeth and the maintenance of the highest physiological oral condition possible.

Will the dentist assume that responsibility? I believe that he will because gradually the basic medical sciences have been added to the dental curriculum. Gross anatomy of the entire body should be taught the student of dentistry in a limited degree, but anatomy of the head and neck should be given to him in much detail. Physiology should be taught to the extent that the dentist should have a clear conception of the functions of the various organs and systems of the body. He should have sufficient knowledge of pathology to understand the process of disease. If the dentist is to assume the role expected of him by the public, he should have a broad knowledge in the matter of diet as it concerns disease and health.

The longer I practice dentistry, the more convinced I become that dentists and physicians can and must cooperate more fully if we are to combat successfully the numerous modern diseases.

In many instances the two fields are very closely linked. In such diseases as infective arthritis, neuritis, migraine, ulcerative stomatitis and colitis, as well as stomach ulcers, gall bladder disease, nephritis, malnutrition and a host of others, any attempt at eradication would be unsuccessful unless the physician and dentist cooperate fully.

What do you as physicians expect of the dentist when a case is referred for treatment? In analyzing this question, I would say that you:

1. First expect a mouth either clean or in the process of being cleaned: teeth properly scaled and good clean surfaces where particles of food, bacteria and tissue debris cannot accumulate with ease.

2. Then you will want healthy gums tight to the gingivae of the teeth and not soft, spongy inflammed gums which harbor all kinds of bacteria.

3. Third you will want simple but effective restorations which fit with ease and comfort and which do not serve as a source of nervous irritability.

4. Fourth you will want sufficient x-ray to be reasonably sure that no infection exists at the apices of the roots or in the tissues surrounding the teeth. Finally you will want a dentist who is not prone to extract teeth wholesale.

Extracting many badly infected teeth at one time is unwise because:

1. It opens the way for an overwhelming rush of bacteria into the bloodstream. If the patient's resistance is low, this may cause a bacteremia or septicemia.

2. It removes an excellent source of autovaccination. Repeated small doses of bacteria in the blood stream from one or two infected sockets act the same as vaccine therapy. If the extraction of a large number of infected teeth from the same patient are spread over a period of several weeks, more can be accomplished than with good vaccines of the same source.

This brings up the subject of focal infection and its relation to systemic disease which has been a much talked of subject in the past decade. Considerable confusion still exists in the minds of both the medical and dental professions as to the effect of dental sepsis on health. This confusion is, in a way, justified. In my experience, many cases referred to me by the physician showed complete relief or marked improvement in their general condition after elimination of dental infection. On the other hand I have seen patients with what seemed to be exactly the same condition get absolutely no relief by the same procedure. Many cases have occurred in my own practice where removal of infection has entirely relieved a condition and also many where removal did absolutely no good. In a good many of these cases that did not clear, I believe that a secondary focus remained in some other part of the body. Many members of both the professions who,

at first, were dubious about the focal infection theory have had experiences which have altered their former opinions.

When asked by a patient if the removal of infected teeth will cure a particular type of disease, whether it involves kidneys, heart, or the joints, most of us have learned to make few predictions. It is so much better to tell the patient that these are bad teeth and that they should be removed whether they are causing this condition or not with the hope that he will be directly benefited. I have actually had medical men call me and say, "I have so and so here in my office and I'm sending him over to have such and such teeth jerked out. He has rheumatism and those teeth are causing it." I believe you will agree with me that that sort of conversation is neither professional nor fair to either the dentist or the patient. You have promised the patient that the removal of those teeth would cure him, and you have also told the dentist what he should do instead of letting him be his own diagnostician. If you are referring a patient to the dentist, you should have confidence enough in his ability to diagnose the case or else not refer the patient to him.

Many opinions exist on the question of focal infection, but to show that a close relationship does exist between dental infection and systemic disease I quote from some of the medical consultants in various sections of the Mayo Clinic regarding dental sepsis in their particular fields.

Dr. George B. Eusterman, in the section on Gastro-Enterology says, "While the actual cause of chronic peptic ulcer still appears to be an obsure one, I think that the clinical, experimental and pathologic evidence is suffiient to say that foci of infection can give rise to the following conditions: gastric submucosal hemorrhage, and hemorragic erosion, which may be symptomless other than giving rise to gross bleeding; acute ulcers of the stomach, acute and subacute gastritis, which may also give rise to symptoms and signs simulating peptic ulcer, even hemorrhage; subacute ulcers of the stomach and, in many cases, indigestion, which may or may not simulate ulcer and which may disappear with the removal of the infection. I feel that dental infection may be the actual starting point of ulcer, but other factors must be present to make it chronic. He continues—"I do not see how any conscientious practitioner, in the light of present knowledge, can ignore the importance of dental infection in the presence of disease of the upper part of the digestive tract. If he assumes any other attitude, I feel that he is doing an injustice to his patients and to medicine in general."

Dr. J. A. Bergen says regarding the lower part of the digestive tract, "There are a number of conditions of the intestinal tract that are related to dental infection. Foremost among these is the streptococcal type of ulcerative colitis. Here the relationship has been clearly shown both experimentally and clinically. Removal of periapical infection and perhaps even the removal of pulpless teeth are of great importance in many cases. Other less serious conditions, even the presence of an irritable bowel are affected favorably by the care of the mouth."

Dr. C. H. Watkins of the section on Clinical Hematology said, "So far as dental infection is concerned, removal of a definite focus will, I think, result in improvement in certain types of anemia which are resistant to treatment. We have seen this occur in numerous cases. It seems to me that the most important thing is a thorough understanding of blood conditions which usually have their initial manifestations in the mucous membrane of the mouth. This would permit an early diagnosis and, in most instances, a great deal of improvement may be obtained."

Dr. W. L. Benedict, Ophthalmologist, says, "Some forms of eye disease that formerly were believed to be due to autotoxemia, injury, blood disease or rheumatism have been demonstrated to be due to the actual presence of bacteria carried to the eye from suppurative foci about the teeth. The barrier that nature erects in defense of the eye may be effective against a specific strain of organism, and since organisms about the teeth multiply in kind as well as in number, the fact that an eye becomes diseased in a person whose mouth has been the harbor of pus-producing foci for years indicates that this barrier has been broken down, that his resistance has been lowered; or it may mean that a new organism has been introduced against which no barrier has been erected."

Attacks of eye disease from dental sepsis may be of any degree of severity. Mild attacks of conjunctivitis or iritis may occur which amount to no more than a transcient type of hyperemia of the conjunctiva. A rapid succession of mild attacks extending over a period of several years has been demonstrated to be due to dental sepsis.

Dr. C. H. Slocumb of the section on Rheumatic Disease said, "Removal of infected foci, including infected teeth, is justified in all patients suffering with arthritis and if the arthritis is difficult to control, the removal of questionable teeth and dental roots should be advised."

Dr. Paul Oleary of the section of Dermatology says, "A significant point in regard to focal infection as it applies to our particular field of medicine is the importance of removing infected teeth as well

as cleaning up the mouth and removing poor and extensive restorations. The presence of pyorrhea infection and a tremenduous amount of metal in the mouth is a great factor in various degrees of salivation from mercury as well as deposits of bismuth following intra-muscular injection of bismuth preparations. Accordingly it is our practice to have all foci of infection treated locally or removed."

Dr. G. J. Thompson of the section on Urology states, "The relationship of infections in the Genito urinary tract to focal infection elsewhere in the body, particularly infected teeth, is quite definite."

"Such infections seem to be an acute manifestation of a previously existing chronic infection and the acute flare-up is undoubtedly evidence of the relationship. Chronic infections in the prostate, bladder and kidney will often not respond to treatment until dental infection has been eliminated. Unfortunately many urologists either are not familiar with these facts or are loath to believe the important part that dental sepsis certainly plays in urologic conditions. Any effort that dentists make to call these facts to the attention of the general practitioner of medicine is very worth while."

Dr. E. C. Rosenow — Division of Bacteriology says, "Dental foci of infection, even though symptomless, are a common cause of systemic disease beyond a question of a doubt."

I have quoted you these statements so that you will realize that this plea for better cooperation between medicine and dentistry comes not entirely from the dentists. We must have this close cooperation in matters clinical and scientific if the problems of medicine and dentistry are to be solved.

At the present time the dental profession is willing and eager to cooperate in all the ways mentioned. The future of both of our professions is at stake and we must present a united effort to combat incompetent clinics, government control and uninterested or uninstructed members within our own ranks.

The dentists responsibility in cancer control is very great. The oral cavity is one of the important sites for the development of neoplasms. Four and five-tenths per cent of all cancers are said to be in the oral cavity or on the lips.

While, of course, there is no definitely known, or accepted cause of cancer, all authorities will agree that the growth of the neoplasms are preceded by a long period of chronic irritation accompanied or followed by cellular hyperplasia.

Of all cancers, perhaps, those of the mouth are the most preventable. Badly decayed teeth with jagged edges against which the tongue, lips, and cheek are constantly rubbing act as chronic irritants. Pyorrhea with accumulation of large amounts of calculus and with the mobility of the teeth may cause a low-grade irritation.

Failure to replace missing teeth causing malocclusion may be the cause of food impaction areas.

Faulty restorations such as crowns, fillings, bridges and dentures are sources of irritation and are factors in the etiology of cancer. Irritation may result from excessive pipe smoking and predispose to cancer of the lips. The dentist is often the first to see these patients because they associate any lesions in the mouth with the teeth. The responsibility to know and to diagnose early cancer in the oral cavity is something the dentist must not avoid.

Failure to recognize these early lesions permits them to grow and invade the lmph channels and often the blood stream and finally to other organs of the body. Only early diagnosis and treatment will increase the permanent cures of cancers of the oral cavity, and it is definitely the duty of the dentist to be able to detect these early manifestations and to see that the patient gets proper medical care.

Ninety-nine of 100 American hospitals were founded within the lifetime of many persons still living today, Richard H. Hutchings, M.D., Utica, N. Y., states in the March issue of Hygeia, The Health Magazine.

"Our grandfathers got along without hospitals very well, or so they thought. In those days nursing was the concern of the women of the family and was accepted as their duty. If attention should be needed at night, friends and neighbors took turns in sitting by the bedside.

"In the early decades of the last century hospitals were to be found only in American seaport cities. These were the most populous centers and here existed the greatest wealth, the direst poverty. With little or no supervision of immigrants, many of the less fortunate were unable to provide for themselves when ill. Here also were to be found the homeless wanderers, sailors from distant ports and the riffraff that follows the sea."

"Those were the conditions which prevailed throughout the period of our own Civil War, for it was not until 1868 that Joseph Lister published the results of his experiments with carbolic acid solution applied directly to the wound, which resulted in prompt healing without the appearance of pus. Stimulated by the work of Lister and Pasteur, the study of micro-organisms concerned in disease and infections made vast strides. Cultures made from dust of the floors, walls, beds and utensils of the wards and operating rooms of the hospitals disclosed the presence of germs of contagious diseases practically everywhere.

"Only then could it be appreciated that hospitals had been the breeding places of infectious diseases, but now, with the precious gift of carbolic acid, and other antiseptics as they were discovered, the wards could be sterilized and kept clean. Later it was demonstrated that if the appliances could be purified in boiling water or steam and by scrupulous care be protected from subsequent contamination, antiseptic solutions might be discarded and the irritation of the skin from contact with carbolic acid or bichloride of mercury could be avoided. This is today's method of aseptic surgery."

President's Page

To the Members of The Kansas Medical Society:

May I especially address the chairmen of the various committees who represent the leadership of the Society activities throughout the year. It must be realized that the accomplishments of the Society during this year rests in the hands of its various committee chairmen and the personnel of the committees. Your activities will be the measure of progress during this time. An outline of possible activities of each committee is being assembled by our Executive Secretary and will shortly be completed.

It is hoped that in the meantime the chairmen of the various committees will also be giving close attention to possible activities that may come under the direct efforts of each committee's activities throughout the year. The agenda, being prepared in conjuction with other activities proposed by the chairmen and the committee personnel, will be the working basis for our efforts in accomplishment throughout the year.

It is anticipated in the near future that meetings will be held with the chairmen in most suitable locations throughout the state and the suggestions compiled by our Secretary and yourselves will be considered and such items that seem most desirable and others deleted until a definite outline of endeavor may clearly be understood by all.

It is considered advisable to have such group meetings early in the fall, promptly after the vacation period. May we hold ourselves in readiness to respond a hundred per cent when the call is sent out for such group meetings. Organization to be efficient must be of necessity time consuming and not without self-sacrifice.

Let us, as the Society's representatives, be willing to give much thought and time and sacrifice to our work for the coming year. May I, at this time, express my appreciation for the many favorable responses accepting committee work. May our enthusiasm continue throughout the year and in the end may we experience a step forward in the progress of medicine in our State.

Sincerely,

Clyde D. Blake MD

EDITORIAL

THEODORE CALDWELL JANEWAY

An interesting article by Flaxman in the May issue of the Bulletin of the History of Medicine is devoted to the life of Theodore Caldwell Janeway and his work on hypertension. He was the son of Edward G. Janeway of New York, who at the turn of the century was considered America's leading clinician consultant and teacher of medicine. The influence of the father was strong and his son acquired much of his extraordinary skill through the professional association which continued for several years.

Theodore Janeway was successively an instructor in medicine at Bellevue Medical College, professor of medicine at Columbia University and full time professor of medicine at Johns Hopkins University. In addition he with Oertel, instituted the clinical pathological conference in New York at the City Hospital which gave a new impetus to the teaching of medicine. He initiated the clinical study of blood pressure in this country and he invented the practical sphygmomanometer for use at the bedside.

Janeway's first book on the clinical study of blood pressure published in 1904 was not the first book on the subject but it was the one that brought the subject to the attention of the American physician. It also was the beginning of an intensive study of all the aspects of hypertension which continued during the remainder of his life.

He carried out experiments on animals to determine the renal factor in hypertension and the influence of epinephrine in the circulating blood. It is particularly significant that he definitely recognized the renal factor in persistent hypertension, altho the mechanism escaped him.

For nine years he studied 870 private cases of essential hypertension and made detailed analyses of their symptoms and course. He states: "Patients exhibiting persistent high blood pressure as the salient feature of their disordered physiology seem more common in private practice than in hospitals, where we see the terminal but seldom the earlier manifestation. When they come to autopsy, as a rule, many secondary effects of the hypertension are present to confuse the picture. For these reason I feel that such facts as I desire to bring forward have a certain validity apart from the postmortem confirmation."

He emphasized the fact that the most important symptoms are circulatory rather than renal, that the most common symptoms are cardiac and he charted the whole life history of the victim of essential hypertension.

It seems a far cry that in 1904 Dr. Janeway rather apologetically suggested that the sphygmomanometer might prove of value in the hands of some physicians.

PUBLIC HEALTH PROGRAMS

An interesting example of varying concepts, relating to needs and proper methods for handling of public health programs, is contained in the following account of a discussion which occurred in Congress on a bill on that subject.

The bill referred to is H.R. 4926, wherein there was included a request by the Children's Bureau of the Department of Labor for an emergency appropriation to provide "maternal and child welfare assistance" in areas having national defense projects.

In a hearing on the bill before the House of Representatives' Committee on Appropriations, Miss Katherine Lenroot, chief of the Children's Bureau, commented as follows in regard to the belief of her department as to the need for the appropriation:

"Striking evidence of the need for maternal and child-health personnel in defense is shown in information received by the Children's Bureau from thirty-four state health agencies. We have very recent information from those agencies which has come in since we submitted our estimate to the Bureau of Budget and which indicates a need far in excess of what we have here. But we do feel, with the additional personnel that would be made possible by the appropriation, we could greatly assist the states in meeting their most urgent needs and in planning for additional resources, either state or local, to provide for more adequate service. . . .

"Now, in order to meet these situations on a minimum basis and as quickly as possible, the Children's Bureau, in conference with representatives of the state agencies responsible for both health and welfare, devised this plan whereby we would add to the staff of the Children's Bureau a certain number of medical officers and public health nurses; graduate nurses to assist in child health clinics and conferences; a few nutritionists; and child welfare workers; that these workers would be employed under civil service, just as our other staff would be employed, but they would be, for the most part, assigned to state agencies of health and welfare with which we are already cooperating under the Social Security Act, under agreements with those agencies as to the communities in which the workers would be placed and the services which they would perform. . . ."

In response to a question submitted by Representative Tarver of Georgia, a member of the committee, as to whether these medical officers so assigned would undertake to supply general medical services in areas around national defense projects, Miss Lenroot replied:

"They would work primarily in maternal and child health conferences and clinics and as consultants, to such prac-

ticing physicians as are available, who would not have the special background in obstetrics or pediatrics, which would be necessary in certain types of cases. I would presume, also, these medical officers would actually take care of sick children if there was no other medical service available in the community."

Pursuing this thought further, Representative Tarver said:

"There is another thing, it seems to me, that ought to be taken into consideration, and that is that these workers in defense areas are getting much higher wages than the ordinary worker in the United States in other types of industry, and I am wondering what justification there is for the Federal Government to provide medical services and nursing services for his family and his children, when the same type of service is not provided for workers in industry and for other citizens of the country. . . .

"It is my observation that doctors and nurses usually go to localities where they can get patients for good pay, and, if there is not a sufficient number of physicians and nurses in those localities for service to families where the well-paid workers are located, I think it would probably be quite as easy a matter for physicians and nurses in private practice to be attracted to those localities as for you to employ them at public expense and send them there."

Representative Keefe, of Wisconsin, also a member of the committee, expressed himself as disturbed by the thought that if the appropriation asked for be made, a program would be initiated under emergency conditions that would not be terminated after the emergency had ceased to exist. He said:

"I am exceedingly interested in the extension of this type of service within the ability of the people of this country to sustain the program. But I am frank to say that the presentation of this matter, as it impresses me, indicates a good deal of hysteria. Now, I have received letters—I suppose because I am a member of this committee; I do not know any other reason why I should receive them—but I have received letters from public health officers and organizations from one end of the country to the other, all of them proclaiming the great need that exists. Granted. You say that you can only just scratch the surface of it with what you are asking here now; you can only fill a little bit of the need. Well, is this going to mean then, that this thing is going to grow and grow and grow until we ultimately achieve the ideas of all these social workers throughout the country as to what they think is necessary for child welfare and maternal care and all that sort of thing throughout the whole country? . . .

"Has there been any evidence of any epidemic in any of these places? Has there been any evidence of any deaths resulting from malnutrition or lack of proper care during childbirth or anything of that kind? Is there any evidence available to show any of those things? . . .

". . . I am frank to say that my short experience in national affairs leads me to conclude that once one of these things gets under way, and once the personnel is established, and once the program is established, it is going to be mighty difficult to keep it from being established forever, despite all the optimism that you display that this is not a permanent program, and that you would like to see it restored to the original status. . . ."

In reporting the bill to the House, the Committee on Appropriations refused to include in it the specific appropriation under discussion and justified its action in the following words:

"A supplemental Budget estimate of $878,000 was submitted to Congress in House Document 211 for the purpose of authorizing the Children's Bureau to undertake the task of supplying services to cope with the problems presented in adequately caring for maternal and child health and welfare in defense areas that have developed in mushroom fashion and where state and local facilities are not sufficient to supply the health needs of the mothers and children resident in these localities.

"As a matter of national policy we have embarked upon a program of grants to states for maternal and child health and welfare. The states, under the terms of these grants, are required to match the Federal funds so given them with certain state moneys. To now embark upon a policy of giving direct Federal aid in these defense areas would be to do violence to the general policy that has been laid down and would doubtless tend to commit the Federal Government to a program of direct Federal participation in a program of maternal and child health and welfare. No such program of this nature is at present authorized by Congress and while there is some division in the subcommittee as to whether the Federal Government should or should not project itself into this picture as an emergency measure, the subcommittee is unanimous in its thought that the subject is of sufficient importance from a policy standpoint as to justify the proper legislative committee reviewing the matter of need and justification for Federal participation with a view of authorizing Federal assistance within defined limits or denying it altogether as the case may be. States and localities have clamored to be beneficiaries of Federal construction for national defense. It does seem to the committee therefore, that those states and localities that have been successful in their quest and have, as a result thereof, increased tremendously their state wealth should proceed to levy taxes sufficient to care for the problems of social welfare that ensued in the wake of vast concentrations of population in these defense areas."

The House of Representatives acquiesced in the recommendation of its Committee on Appropriations and the bill has now been enacted into a law without the requested appropriation.

It is probably true that most physicians, and most other persons who are accurately familiar with the needs of public health, will agree with the opinions expressed by Representative Tarver and Representative Keefe. Instead of public health money being wasted in un-needed instances of this kind, and in many similar instances, what a wonderful thing it would be if the public health concepts and the public health expenditures of this country could be unified and standardized behind the great needs of lay-education, assistance in the care of the indigent, the elimination of cults and other unqualified practitioners, and the provision of needed equipment and facilities.

There are 6,043 more physicians practicing medicine than there were last year. According to the Journal of the A.M.A. about 4,000 doctors were removed by death.

TUBERCULOSIS CONTROL

TUBERCULIN TESTING IN CHICAGO SCHOOLS

This survey was carried out by the Chicago Municipal Sanitarium, aided by the Tuberculosis Institute of Chicago and Cook County.

The survey policy of the Municipal Tuberculosis Sanitarium had hitherto been largely oriented toward older groups. Tuberculin testing in the schools, therefore, represented a deviation from established policy and was undertaken in order to explore educational values, morbidity rates, and case-finding potentialities of a follow-up of the reactors and to check on existent case-finding machinery.

As the purpose was to obtain a cross-section of tuberculosis morbidity, the survey attempted to include every Chicago school. However, it was necessary to sacrifice certain ambitions, such as a 100 per cent consent and a thorough survey of each school. In a general way, the policy ran, "Get what consents you can in the time allotted and go on to the next school."

Kindergarten, first and eighth grade children and all available students in the high schools were examined because a positive reaction in a kindergarten or first grade child might have some epidemiological significance; eighth grade children were on the threshold of adolescence and many would not go to high school. Thus it might be their last chance of inclusion in a case-finding effort. In view of the many studies already made, justifiability of high school examination was hardly debatable.

First, the Board of Education notified the principals. Then the nurse addressed the teachers and children in each room. All were given appropriate literature which, with the consent card, the children took home. After due interval the operating team did the tuberculin test and results were read in forty-eight hours.

In all, 176,878 consents were obtained in 561 public elementary schools, 115 public high schools, 347 parochial elementary schools, forty-seven parochial high schools, twelve trade and vocational schools and five junior colleges.

A self-contained and complete mobile unit, the first as far as is known to be used in the x-ray field, was devised. On starting work the truck drove into the school yard and the technician selected a location as near as possible to space for extra dressing rooms. Current was obtained through a cable from a school connection.

The procedure, carefully standardized, was to give a single Mantoux test using Purified Protein Derivative in an amount one-tenth the usual final dose. The percentage of reactors with this dose was low compared with the experience in other urban areas so the injection unit was doubled in the latter part of the work, except in the case of Negroes and Mexicans who had shown marked sensitivity to tuberculin.

In the 167,345 children tested, 27,401 proved positive. To March 1, 1940, 23,532 had been x-rayed and 218 cases of reinfection type tuberculosis were found of whom 109, or fifty per cent, were in the moderately or far advanced stage; in 4,524 children, evidence of primary infection type tuberculosis was found.

The reactor rate and the primary tuberculosis rate was practically the same for boys and girls but the incidence of reinfection type tuberculosis was twice as high in girls. The incidence of disease among children x-rayed was higher in Negroes and Mexicans but not to the same degree as the infection rate. The Negro children had slightly less primary tuberculosis than the white.

The study seemed to bear out the reports of other workers who found a lack of constant correlation between tuberculin sensitivity and tuberculous calcifications.

In comparison with other metropolitan surveys, the reaction incidence in Chicago is low. This may be due to the fact that no open case may live in the same home with children under sixteen. Contact is broken as soon as possible after discovery of the case.

Survey results confined to a district or a constellation of districts would lead to false conclusions. The survey included schools in every district and children from every economic level. The major part of the tuberculosis problem is sharply localized. About four of the seventy-five census districts account for thirty-eight per cent of the deaths. Mortality in these areas is much higher than the general rate, namely, 196 per 100,000 as compared to 51.6 per 100,000 for the city as a whole. Morbidity figures run low in the same ratio.

In Chicago, as elsewhere, decreasing mortality rates probably exerted influence on the composition of the infection index. The rate has fallen from 147.9 per 100,000 in 1917 to 51.6 per 100,000 in 1939. Over the same period, the rate has fallen from 133.9 to 34.0 for whites and from 414.0 to 281.7 for Negroes, per 100,000.

In an attempt to estimate the diminution of the reactor rate the present figures may be compared to older studies, one made by Webb of the University

of Chicago in 1930-31, the other by Novak and Kruglick of the Tuberculosis Institute of Chicago and Cook County in 1933-37. Webb tested no high school children and Novak and Kruglick tested no elementary school children. In elementary school ages, comparing Webb's figures with the present study, since 1930-31 there has been a definite drop for each age period. Comparing high school tests for 1933-37 and 1936-39, there is also a substantial drop for each age period, except for age twenty; only twenty-nine students of this age were tested in the Novak study.

The specific relation between the tuberculin positives and tuberculosis in the home was clearly demonstrated in the present survey. The source of infection was unmistakably established in 3,284 instances but of these only 226 were new pulmonary cases.

The comparatively small number of new cases found in the families of the positive reactors was both a disappointment and a satisfaction. A larger proportion of new tuberculosis had been anticipated but it was encouraging to know that the existent case-finding machinery was effective, since in ninety per cent of the cases the source of infection was already under supervision.

Altogether, 586 new cases of tuberculosis were found. The total cost chargeable to the survey for the 586 cases found was $511.95 per case.

In order to explore its potentialities, figuratively speaking, the miniature x-ray was carried almost to the doorstep of the people in the congested areas. The equipment was hooked up to the mobile x-ray truck and this self-contained unit, including dressing rooms, was taken to various locations. The plan, still operative, aims to make an x-ray examination of every man, woman and child in certain areas of gross congestion, high tuberculosis mortality and low economic status.

In the school survey, lasting three years and comprising 23,532 x-ray examinations, 218 new cases were found on the first film. In the miniature x-ray survey comprising 20,956 examinations and lasting five months, 675 new cases were found by the original x-ray.

SUMMARY

During the three-year period, 167,345 children were tuberculin tested and 23,532 x-rayed. The reactor incidence was 7.04 per cent for kindergarten and first grade, 19.82 per cent for eighth grade, 21.29 per cent for high school students and 29.97 per cent for miscellaneous schools and colleges. The rate for Negroes was twice that of whites and for Mexicans it was still higher.

This study shows a substantial drop in the reactor rate in Chicago as compared with older studies. The city-wide survey emphasized the fact that each district had its own reactor rate which was allied to local mortality rates.

Of 57,481 children under twelve tested with tuberculin, nine cases of pulmonary disease were found, which is comparable to figures for this age group in the mortality tables. Facts point toward the adolescent and early adult years as the case-finding provinces. In testing adults in highly infected milieus (sixty per cent reactions or more) x-ray of the entire group is cheaper than tuberculin testing with x-ray of the positives.—From Tuberculosis Abstracts, August, 1941, reprinted from the Bulletin, Chicago Municipal Sanitarium, Vols. 18-19-20, Years 1938-39-40, 1-12, inc.

NEWS NOTES

COMMITTEE MEETING

A meeting of the Committee on Conservation of Eye Sight was held in Topeka on July 17. Plans of the committee for the coming year were discussed.

CONGRESS

H.R. 4476, a bill authorizing the employment of osteopaths as well as doctors of medicine in the intern facilities of the United States Army, was passed by the House of Representatives on July 21. The bill is now pending in the Committee on Military Affairs in the Senate.

H.R. 4965, which contains a similar provision, was passed by the House and the Senate and signed by the President. H.R. 4476 differs from H.R. 4965 in that the latter was an appropriation measure containing the above authorization only for the current year. H.R. 4476 contains a permanent authorization in that regard.

AUTOPSIES

It is believed that the following opinion prepared by Senator Kirke Dale of Arkansas City, in regard to the performance of autopsies, will be of interest to all members.

"I assume you refer to autopsies done without the consent of relatives of the deceased or persons entitled to the possession of the body.

Section 19-1003, G. S. 1935 provides:

'The coroner shall hold an inquest upon the dead bodies of such persons only as are supposed to have died by unlawful means, or the cause of whose death is unknown.' and in such inquest it shall be his (the coroner's) duty to summon forthwith, six citizens of the county to appear before him at a time and place named.'

The purpose of the inquest is, of course, to ascertain if possible, the cause of death, and where the death is (a) supposed to have been caused by unlawful means or (b) unknown.

At the inquest the evidence is presented to the jury and it is the jury, not the coroner, which returns the verdict.

The coroner acts in a ministerial capacity and presents or causes to be presented to the jury all available evidence.

Section 19-1017, G. S. 1935 provides:

'In an inquisition by a coroner, when he or the jury shall deem it requisite, he may summons one or more physicians or surgeons to make scientific examination, who shall be allowed reasonable compensation by the Board of County Commissioners.'

The section last above quoted has not, so far as I can find, been construed or passed upon by our Supreme Court and until our court has spoken, it is impossible to answer this question with definite assurance.

I can, however, give you my own personal construction and opinion based upon the statutes above quoted and the law generally.

An autopsy is defined as a post-mortem examination. Sec. 19-1017 contemplates, when deemed requisite by the coroner or the coroner's jury, a scientific examination of the body by one or more surgeons or physicians summoned by the coroner. It is my opinion that this scientific examination deemed requisite by the coroner or the coroner's jury would include an autopsy, if such was necessary to or beneficial in determining whether the death was caused by unlawful means or the cause of death of same is actually unknown. I do not believe that an autopsy would be warranted simply for the purpose of settling a dispute as the cause of death.

It is generally conceded that autopsies are sometimes essential to the protection of health and the discovery of crime. In such a case, the welfare of society demands that the state or its authorized representatives be permitted to conduct an examination or have an examination made by dissection, if necessary, without reference to the wishes of the relatives of the dead. Hence, a coroner has a right to perform an autopsy or have one performed where good reason therefore exists, and there is no liability on his part if the autopsy is performed in an ordinarily careful manner, notwithstanding the absence of consent by the members of the deceased's family. No action can be maintained against a coroner or against the examining physician for the ordering or performing of an autopsy or post-mortem examination where the circumstances are such as to render the examination reasonably necessary and proper in the exercise of the duties of such coroner and medical examiner and if the work is done in a decent manner and without wantonly disfiguring the body. On the other hand the performance of an autopsy by a coroner or one designated by him in the absence of sufficient facts to bring the case within a statute giving the coroner such a right, is a basis for the recovery of damages, although there was no wilfull and wanton mutilation of the body and the wrongful act itself is the infringement of a legal right. You should also remember that an invalid or unauthorized order for an autopsy issued by a coroner does not protect the physician against liability for performing the autopsy.

It is therefore my opinion that before you participate at an inquest by making a scientific examination of the body, you should, if possible, assure yourself that the body is that of a person supposed to have died of unlawful means or is a person the cause of whose death is unknown, and under no circumstances should you perform an autopsy until in the process of conducting the inquest the coroner or the coroner's jury shall have deemed it requisite that a scientific examination of the body be made and for your protection I think you should see that such a finding or order is made a part of the record of the inquest."

F. S. A. PLANS

The Farm Security Administration District Office at Amarillo, Texas, has issued the following report pertaining to the operation of the Southwestern Kansas Mutual Aid Association during the past two years.

The Southwestern Kansas Mutual Aid Association is the title of the joint F. S. A. medical plan which is being operated in Greeley, Wichita, Scott, Lane, Hamilton, Kearney, Finney, Stanton, Grant, Haskell, Gray, Ford, Morton, Stevens, Seward, Meade, Clark, and Hodgemen counties.

	Fiscal Year Ending 4-30-40	Fiscal Year Ending 4-30-41
Total Membership Served	642	691
Membership Fees—per year	$ 30.00	$ 28.00
Total Funds Available for Medical Service	18,427.58	19,583.75
Total Funds Available for Administration	751.81	849.92
Obligations for Physicians Services	13,759.20	13,027.45
Physicians Services Paid	9,768.51	12,491.78
Obligations for Optical Services	348.00	24.00
Optical Services Paid	348.00	24.00
Obligations for Hospitalization	4,652.82	4,885.50
Hospitalization Paid	4,652.82	4,885.50
Obligations for Drugs	2,640.47	.....
Drugs Paid	2,640.47	.....
Obligations for Dentists	1,091.00	1,027.00
Dentists Paid	1,091.00	1,027.00
Obligations for Nurses	14.50	24.00
Nurses Paid	13.25	24.00
Obligations for Chronic Treatment	218.00	928.75
Chronic Treatment Paid	218.00	928.75
Obligations for X-Ray and Anesthetics	.....	105.00
X-Ray and Anesthetics Paid	.....	97.37
Obligations for Administration	751.81	951.47
Administration Paid	751.81	951.47
Deficit	4,296.46	534.50

The fees quoted under the plan are listed below. Payments are made under these fee schedules in accordance with the recommendations of the auditing committee and to the extent that sufficient funds are available.

FEE BASIS FOR SERVICE RENDERED			
Office Call	$ 1.00		
Home Call	2.00		
Obstetrics—Hospital	15.00		
Obstetrics—Home	25.00		
Mileage—First 20 miles, per mile	.50	thereafter	$0.10
Tonsillectomy	15.00		
Appendectomy	50.00		
Hospital Room—First day	4.00	thereafter	$3.00
Teeth Extraction—Each	1.00		
Filling—Each	$1.00 to $3.50		

FEDERAL ASSISTANCE

A bill is presently pending in Congress which if passed will make it possible for communities having national-defense projects to receive Federal financial assistance for the construction and maintance of hospitals and other facilities for the care of the sick.

Excerpts from the bill (H.R. 4545) are as follows:

"Defense Housing—It is hereby declared to be the policy of this title to provide means by which public works may be acquired, maintained, and operated in the areas described in section 202. As used in this title, the term

'public work' means any facility necessary for carrying on community life substantially expanded by the national-defense program, but the activities authorized under this title shall be devoted primarily to schools, waterworks, sewers, sewage, garbage and refuse disposal facilities, public sanitary facilities, works for the treatment and purification of water, hospitals and other places for the care of the sick, recreational facilities, and streets and access roads.

Section 202. Whenever the President finds that in any area or locality an acute shortage of public works or equipment for public works necessary to the health, safety, or welfare of persons engaged in national-defense activities exists or impends which would impende national-defense activities, and that such public works or equipment cannot otherwise be provided when needed, or could not be provided without the imposition of an increased excessive tax burden or an unusual or excessive increase in the debt limit of the taxing or borrowing authority in which such shortage exists, the Federal Work Administrator is authorized, with the approval of the President, in order to relieve such shortage"—to make arrangements therefor—

"No department or agency of the United States shall exercise any supervision or control over any hospital or other place for the care of the sick (which is not owned or operated by the United States) with respect to which any funds have been or may be expended under this title relating to, or any lease, grant, loan, or contribution made under this title to, or on behalf of, any such hospital or place, prescribed or affect its administration, personnel, or operation."

APPOINTMENT

Warden M. F. Amrine of the Kansas State Prison at Lansing has announced that Dr. David R. Sterett and Dr. J. W. Risdon, both of Leavenworth have been appointed as physicians for the prison.

Dr. Sterett will serve as physician and superintendent of the prison hospital and Dr. Risdon will serve as surgeon and assistant physician.

NEW EXCHANGES

The Journal acknowledges the addition to its exchanges of the Revista Medical Municipal published in Rio de Janero, La Prensa Medica Mexicana of Guanajuano, Mexico, the Bulletin De Biologie et De Medecine Experimental De L'uress of Moscow, and the Journal of the Philippine Medical Association. All are creditable publications and it is our hope that these exchanges will promote and intensify the relationship with their respective countries.

NUTRITIONAL CONFERENCE

The new Committee on Nutrition, which was recently appointed by Governor Payne H. Ratner, will hold its first annual session in Topeka on October 17-18, 1941.

Plans are being made for various organizations to be invited to the meeting and for a program to be presented consisting of papers and other discussions on nutrition.

The Kansas committee was organized in conjunction with a national-defense program of having similar committees in each state engage in coordinated activities on this subject. The chairman of the Kansas committee is Dr. Margaret Justin of the Kansas State College of Manhattan. Dr. Paul E. Belknap of Topeka is the physician member of the committee.

RESIGNATION

Dr. Thomas L. Foster recently resigned his position as superintendent of the Osawatomie State Hospital in order to accept an appointment in the Psychiatric Department of the Hertzler Clinic at Halstead. Dr. Foster's successor has not as yet been announced by the Kansas State Board of Social Welfare.

LOCATIONS

The Society Committee on Locations knows of a considerable number of locations which are available by reason of physicians being called to military duty and through other vacancies. Physicians who would be interested in new or changed locations are asked to communicate with Dr. A. C. Armitage, Hutchinson, chairman of the above committee, or the Society central office.

LEAVE OF ABSENCE

Dr. F. P. Helm, Secretary of the Kansas State Board of Health, has been granted a nine months leave of absence by the Board in order that he may take additional post-graduate work in public health at the Johns Hopkins School of Medicine in Baltimore, Maryland.

Dr. Helm will leave for Baltimore on September 10.

LETTER

Mr. Jay S. Parker, Attorney General of the state of Kansas recently forwarded the following letter to each of the new physicians licensed by the Kansas State Board of Registration and Examination, at the June examinations:

"I note in recent editions of the daily papers your name is listed as one who is now licensed to practice medicine in Kansas.

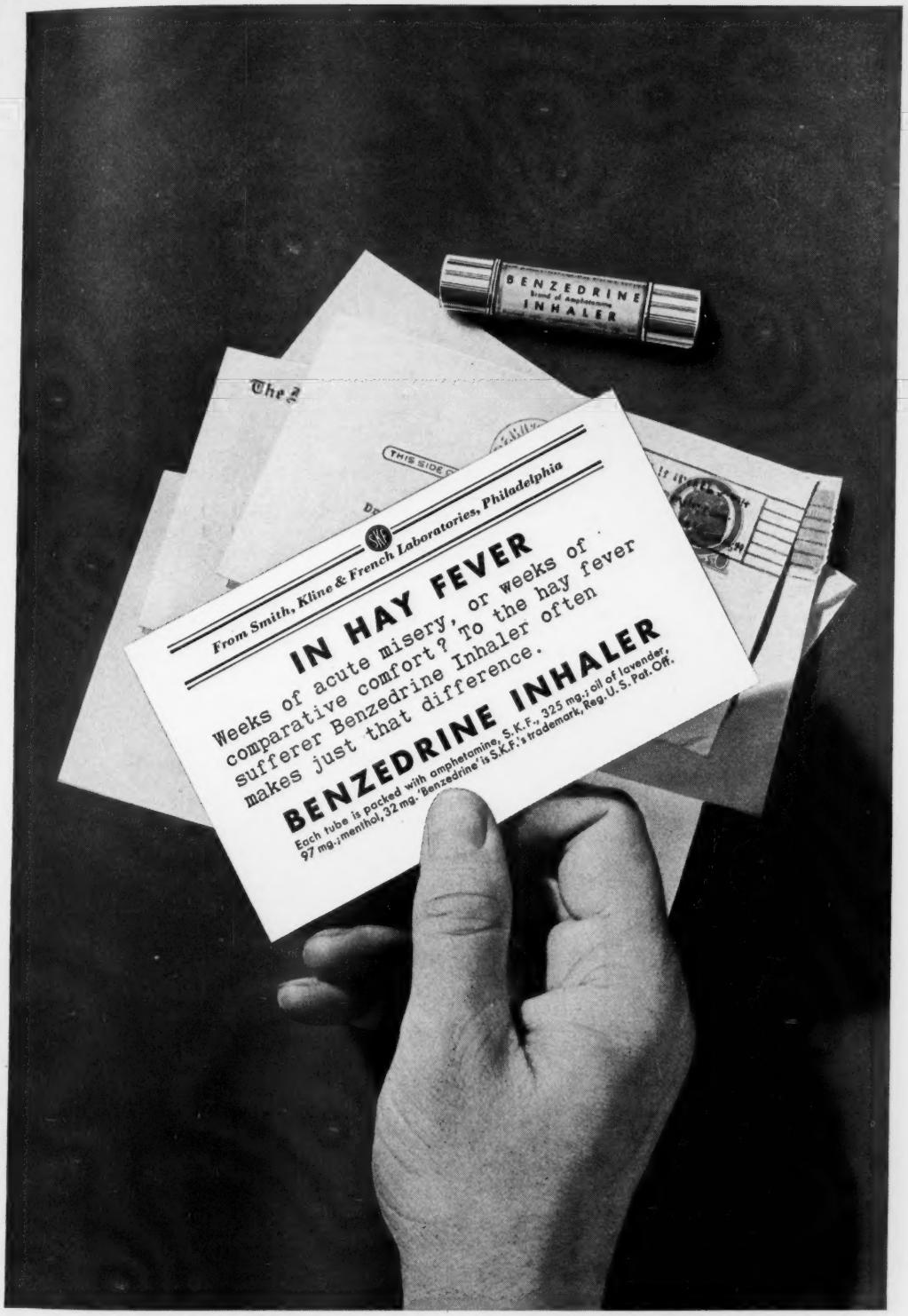
As one who grew up in a family of doctors, and has a father and brother engaged in the practice, I have had an opportunity to become intimately acquainted with a great many of the members of your profession and have always taken a great interest in its success.

You are now an active member of one of the oldest professions in the world and your opportunities for service to the public are unlimited. I know something about what it takes to obtain a license to practice medicine in this state and I realize you have achieved success by a lot of hard work and effort. For that reason, I desire to take this opportunity to offer you my sincere and hearty congratulations and extend to you for the years to come my best wishes for every success in the practice of your chosen profession."

FEEDING CARDS

The Kansas State Board of Health has published a series of cards containing suggestions for the feeding and care of infants and children. The cards have been divided as follows: Card one for children four months of age or less; card two for the fifth, sixth, seventh, and eighth month; card three for the ninth, tenth and eleventh month; card four for the twelfth to the twenty-third month and card five for two to five years inclusive.

A letter describing the cards, forwarded by the Board to all Kansas doctors of medicine, contains the following suggestions: "Your interest in the health of our Kansas children has been appreciated by the Child Hygiene Divi-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sion. In an endeavor to be of service to you along this line, the Division of Child Hygiene is enclosing a newly prepared set of Infant and Preschool Feeding cards for your consideration. It is thought, if used correctly, these would be an aid to you and your patients because: (1) It would relieve you of a great deal of detail and explanation, thus minimizing the chances for some of the instructions being overlooked, yet the cards are so written that you can add to or change with a stroke or two of the pen to suit the individual needs of the child. (2) The cards are a reminder to the mothers to take the baby to see her physician when the baby is well so that he can help her to keep it well. (3) While some of the mothers are able to buy prepared food, some are financially unable to do so, therefore, methods are given for preparing certain foods from the garden so that the money may be used for other necessary things such as cod liver oil, immunizations, and medical care. (4) The mother is reminded of immunization time and the cards will aid as a reminder to the physician in case this should slip his mind when the child is present."

Supplies of the cards may be obtained from the Division of Child Hygiene of the Kansas State Board of Health at Topeka or from the county public health nurses.

OPINION

The following opinion prepared by Mr. Theo F. Varner of Independence, attorney for the Kansas State Board of Medical Registration and Examination, was published in the Kansas Pharmaceutical News for July:

"Answering the inquiries still coming into this office on 'What can we do on osteopath prescriptions?' we present the following letter:

June 26, 1941

Dr. J. F. Hassis, Secretary
Kansas State Medical Board
804 Huron Building
Kansas City, Kansas

Dear Doctor Hassig:

It is my understanding that Mrs. C. B. Miller, Executive Secretary of the Kansas Pharmaceutical Association has made further inquiry of you relative to the powers and duties of licensed pharmacists in filling prescriptions written by osteopaths.

The law is well settled in this state that osteopaths are not permitted to use drugs or perform surgical operations in the practice of osteopathy. This rule has been applied both in the Supreme Court of this state and the U. S. Circuit Court of Appeals. In view of the fact that the use of drugs by osteopaths is in violation of the law it would seem clear that pharmacists filling prescriptions calling for the use of such drugs would be aiding and abetting the violation of the law.

I am very pleased to report that rather extensive investigations throughout the state have disclosed that many osteopaths have discontinued violating the law in this respect. It has also been my observation that the licensed pharmacists of the state, with few exceptions, have been and do refuse to fill prescriptions written by osteopaths.

I am sure that the few remaining who do so would discontinue that practice if they fully realized the possible consequences which might follow that unlawful act. I refer, of course, to the civil liability that might arise against the pharmacists as well as the chances of criminal prosecution and the chances of being made a party to an injunction suit.

I trust that these views will be of some benefit to you as well as Mrs. Miller and the Pharmaceutical Association, and beg to remain."

Yours very truly,
THEO. F. VARNER.

MEMBERS

Dr. L. G. Balding, formerly of Manhattan, and Dr. Clifford Van Pelt, formerly of Riley, have announced the opening of an office in Junction City.

Dr. R. R. Becker, formerly of Spring Hill, has moved to Kansas City, Missouri, where he will open an office.

The following articles prepared by Kansas members and published in the Journal were recently abstracted in other publications: "Tuberculosis Case Findings in University of Kansas Students" by Dr. Ralph I. Canuteson of Lawrence, appeared in the July issue of Radiology; "X-Ray Interpretation in Tuberculosis Case-Findings" by Dr. Galen M. Tice of Kansas City was reprinted in the July issue of Radiology; and "The Non-Effectiveness of Metarazol Therapy in the Treatment of Schizophrenia (Dementia Praecox)" by Dr. G. Wilse Robinson of Kansas City, Missouri, was reprinted in the June issue of Southern Medicine and Surgery.

Dr. C. E. Coburn of Kansas City was named as representative director for the National Tuberculosis Association for a two year term and Dr. Charles H. Lerrigo of Topeka was appointed to the Advisory Committee of the Conference of Child Health and Education of the same organization, at the annual meeting of that organization held in Cleveland, Ohio, in May.

Dr. J. G. Hughbanks of Independence spoke before the Kiwanis club of that city on "The Use of Instruments in Surgery," at a meeting of that organization on July 3.

Dr. S. N. Mallison of El Dorado spoke to the Rotary club of El Dorado, on July 23, on the subject of "Health Conditions in Butler County."

Dr. John M. Porter of Concordia was a speaker at the meeting of the North-Central Kansas Social Welfare Association, held in Concordia on July 17. Dr. Porter discussed "The Medical Phase of Social Welfare."

Dr. Herbert Randles, formerly of White City, has moved to Fort Scott where he will practice with his son, Dr. Leland Randles.

Dr. Charles E. Rombold of Wichita and Dr. John H. Kleinheksel of Wichita were guest speakers at a meeting of the Woods-Alfalfa County Medical Society held in Cherokee, Oklahoma, on May 27. Dr. Rombold spoke on "Back Ache" and Dr. Kleinheksel spoke on "Diabetes."

Dr. George L. Thorpe, formerly of Wichita, has announced the opening of an office in Valley Center.

Dr. Charles L. White of Ellinwood left for Kansas City on June 30, where he will complete a year of post-graduate

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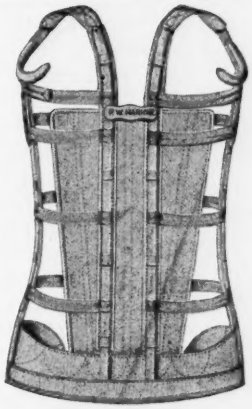

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work at the University of Kansas School of Medicine. Dr. J. M. Gaume, formerly of Salina, has taken over Dr. White's practice during his absence.

DEATH NOTICES

Dr. Melvin Collins of Oxford, 80 years of age, died of chronic nephritis on June 9 in Wakefield. Dr. Collins was graduated from the Rush Medical College of Chicago in 1891. He was an honorary member of the Sumner County Medical Society.

Dr. Robert R. Robson, 85 years of age, died on July 7 at his home in Mayetta. Dr. Robson was graduated from the Ensworth Medical College of St. Joseph, Missouri in 1889. He was an honorary member of the Jackson County Medical Society.

Dr. Petros G. W. VanderWyst, 64 years of age, died on May 29 of nephrolithiasis hypertension at his home in Altoona. He was graduated from the Hering Medical College of Chicago in 1912. Dr. VanderWyst was a member of the Wilson County Medical Society.

Dr. Alfred F. Yohe, 76 years of age, died on July 23 at his home in Leavenworth, following an operation. Dr. Yohe was born in Leavenworth County in 1865. He was graduated from the Rush Medical College of Chicago in 1888 and from the Bellevue Medical College in 1892. He as a member of the Leavenworth County Medical Society and had served as physician at the Federal Penitentiary for twenty years.

BOOKS RECEIVED

MANUAL OF PHYSICAL DIAGNOSIS—With Special Consideration of the Heart and Lungs—Maurice Lewison, M.D., and Ellis B. Frelich, M.D., in collaboration with George C. Coe, M.D. Published by the Year Book Publishers, Inc., 304 Souht Dearborn Street, Chicago, Illinois. Contains 317 pages, illustrated. Table of contents includes, History of Anamnesis, General Observation, Systemic Examination. Examination of the Respiratory System, the Cardiovascular System, the Abdomen, Genitalis, Extremities and Reflexes.

THE 1940 YEAR BOOK OF PEDIATRICS—Edited by Isaac A. Abt, D.Sc., M.D., Professor of Pediatrics, Northwestern University Medical School, Attending Physician, Passavant Hospital, Consulting Physician Children's Memorial Hospital and St. Luke's Hospital, Chicago; with the collaboration of Arthur F. Abt, B.S., M.D., Assistant Professor of Pediatrics, Northwestern University Medical School; Associate Attending Pediatrician, Michael Reese Hospital; Attending Pediatrician, Chicago Maternity Center; Children and La Rabids Jackson Park Sanitorium, Chicago. Priced at $2.50. Published by the Year Book Publishers, Inc., Chicago, Illinois. Containing 590 pages illustrated.

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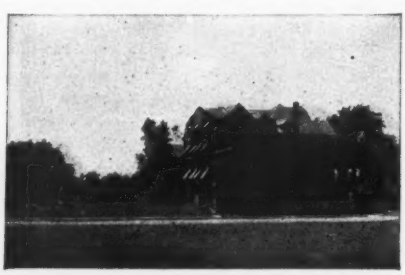

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ANNOUNCEMENTS

The American Neisserian Medical Society has announced that it will award an annual prize of one hundred dollars, to be known as the P. S. Pelouze Award, to the physician under thirty-five years of age who, in the opinion of the Committee on Awards of the organization, has made the outstanding contribution to the control of gonococcal infection during the preceding year. Nominations for the award should be sent to Dr. Oscar F. Cox, Secretary of the American Neisserian Medical Society, 475 Commonwealth Avenue, Boston, Massachusetts, not later than March 31 of each year.

The Nineteenth Annual Fall Clinical Conference will be held in Kansas City, Missouri, on October 7-9. The Kansas City Southwest Clinical Society have scheduled fifteen distinguished guest speakers, announcement of whom will appear in a later issue of the Journal.

The thirty-first annual Clinical Congress of the American College of Surgeons will be held in Boston, Massachusetts on November 3-7, 1941.

KANSAS MEDICAL ASSISTANTS

A meeting of the Council of the Kansas Medical Assistants Society has been called by the President, Mrs. Vera Mathews, for August 31, at 7:30 p.m. at the Hotel Leon, in Hutchinson.

AUXILIARY

PRESIDENT'S MESSAGE

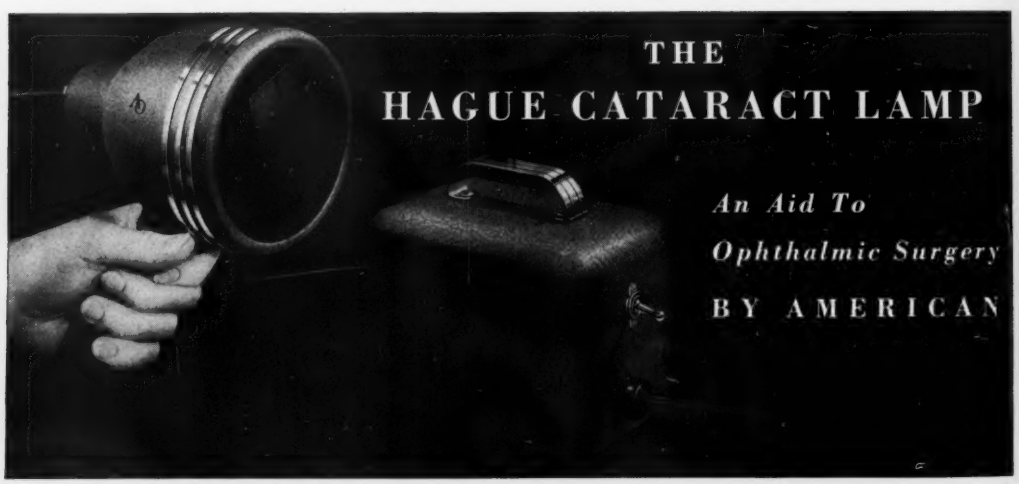
When this magazine reaches you it will be almost time for our first Auxiliary meeting of the fall. As we begin our year's program, let us take our work seriously for it is really a privilege to foster an organization that could be of such great service to our families, to our doctors, and to our communities. We are urged to study and to learn the eight points of the American Medical Association; to study and to learn to understand ourselves, and thus cultivate friendliness, tolerance and understanding.

As soon as the National Bulletin is sent out to us we will find plenty of program material. As nutrition is "one of our most vital defense problems" there will be interesting outlines of study on this subject. Above all other housewives, the doctor's wife should be an informed leader in maintaining a good health standard. Also in this next issue there will be a proposed study program of legislative procedure. Here again we can have an effective influence on the women in our respective communities.

We urge that every member of the state board will attend the state board meeting in Wakeeney on September 23. You will receive specific information on this meeting some time near the first of September. Please hold the date open.

Sincerely,

Mrs. W. Y. Herrick.



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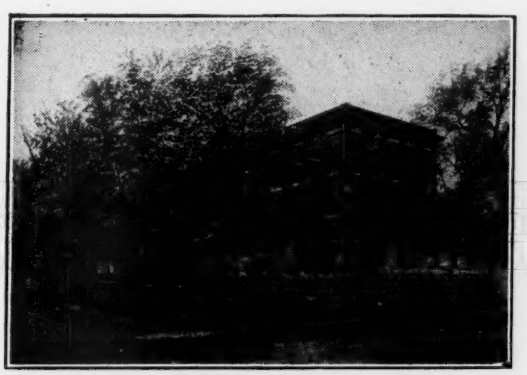

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AUXILIARY NOTES

Dr. Morris Fishbein has said: "Doctors wives should know what is going on. A wife is not a first-class doctor's wife unless she knows about his work and the progress being made in medicine."

A prediction of the future is given by Dr. Nathan B. Van Etton when he says: "I believe that the quality of your membership is such that you may be able to influence women's organizations of all kinds in a beneficial way for the service of the community and the promotion of public health. I believe that you can materially influence health statistics in the next decade!"

SUGGESTIONS TO COUNTY AUXILIARIES

1. Consult your local advisory board before launching on any new adventure in auxiliary work.
2. Plan part of your program along health problems, one very outstanding one being the nutrition problem. Inquire from your health department what your local situation is and encourage your members to study these needs.
3. Have your legislation chairman inform herself on pending legislation as to health and make a report at each meeting.
4. Study your Hygeia and the Bulletin—urge your member to subscribe to both. The Bulletin will be our official organ of information this year.

Sources for program material:

Hygeia—The Health Magazine, American Medical Association, 535 North Dearborn Street, Chicago, Illinois.

Bureau of Health Education—American Medical Association, 535 North Dearborn Street, Chicago, Illinois.

Bureau of Home Economics—Department of Agriculture, Washington, D. C.

Kansas State Board of Health, State House, Topeka.

Mrs. H. L. Regier, Program Chairman.

FOR SALE—Two operating tables (one army style—one Ferguson). Nose and throat treatment chair and stool. Lead box 15x18 inches; Fluoroscope screen, Fisher 12x16 inches; Microscope bell; Eye glass trial case. Write Miss Floy Liston, Baldwin, Kansas.

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Silver Picrate, Wyeth, has a convincing record of effectiveness as a local treatment for acute anterior urethritis caused by Neisseria gonorrheae.[1] An aqueous solution (0.5 percent) of silver picrate or water-soluble jelly (0.5 percent) are employed in the treatment.

1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., **23**, 201 (March), 1939.

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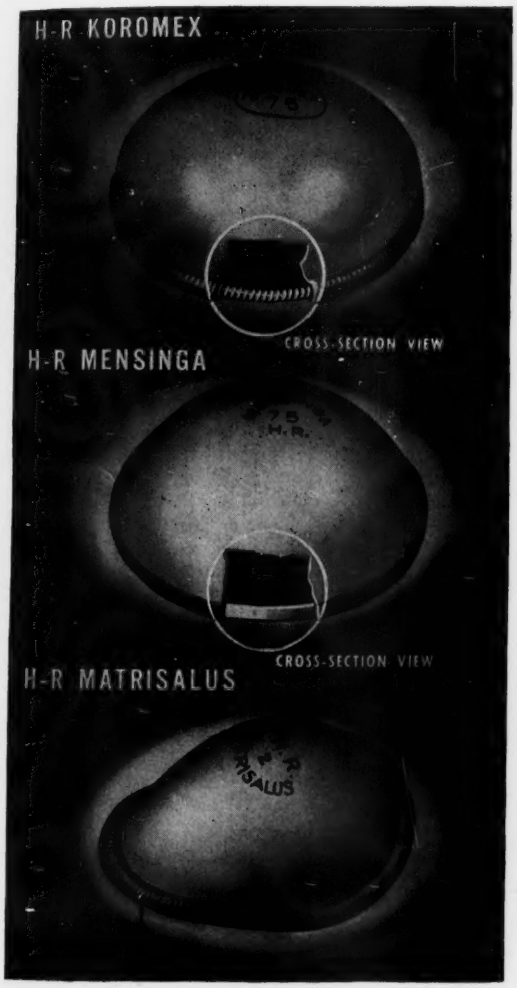

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NOTICE

The fall Auxiliary Board meeting has been announced for September 23, at Wakeeney, by Mrs. W. Y. Herrick, President of the Kansas State Auxiliary. An invitation is extended to all Past President, State Officers, Chairman of the Standing Committees, County Auxiliary Presidents, and Councilors to attend this meeting, at which plans will be formulated for the current year.

FOOD SELECTION SCORE CARD*

Perfect Score	CREDITS	Columns for Daily check						
20	MILK Adults: ½ pint, 10; ¾ pint, 15; 1 pint, 20 Children: ¾ pint, 10; 1 pint, 15, ¾-1 qt., 20							
40	VEGETABLES AND FRUITS Vegetables 1 serving, 5; 2 servings, 10; 3 servings, 15 Potatoes may be included, extra credit, 5 If leafy vegetable is included, extra credit, 5 Fruits 1 serving, 10; 2 servings, 15 If raw fruit or vegetable or canned tomato is included, extra credit, 5							
15	WHOLE GRAIN PRODUCTS 1 serving, 10; 2 servings, 15							
15	CHEESE, EGGS, MEAT, DRIED BEANS or PEAS 1 serving of any one of above, 10 1 serving of any two of above, 15							
10	WATER (total liquid) Adult: 1½ quarts, 5; 2 quarts, 10 Children: 1 quart, 5; 1½ quarts, 10							
100	TOTAL CREDITS							

If your final score is between eighty-five and 100, with not less than ten credits under each point, your food selection has been good. A score of from seventy-five to eighty-five indicates a fair standard. Credits below seventy-five indicate a low standard. List the ways in which your diet is deficient and suggest specific means of improvement.

*Courtesy of the United States Department of Agriculture Co-operative Extension Work in Agriculture and Home Economics, Adapted.

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INDEX TO ADVERTISERS

American Optical Company 364
Balyeat Hay Fever & Asthma Clinic III
Capper Printing Company 363
Cook County Graduate School of Medicine . . 361
General Electric X-Ray Corporation XI
Grandview Sanitarium 361
Hanicke Mfg. Company, The P. W. 361
Holland-Rantos Company, Inc. 367
Isle Company, The W. E. 368
Jayhawk Hotel 363
Johnson Hospital 366
Kansas Industrial Development Comm. VII
Lattimore Laboratories III
Library, The University of Kansas XIV
Lilly & Company, Eli XII
Luzier's Cosmetics & Perfumes XIII
Major Clinic, The 365
Mead Johnson & Company XVI
Medical Protective Company 368
Oakwood Sanitarium VI
Parke Davis & Company IX
Petrolagar Laboratories II
Physicians Casualty Association XIV
Quinton-Duffens Optical Company 363
Ralph Sanitarium 362
Radium & Randon Corporation 368
S. M. A., Corporation XV
Smith, Kline & French Laboratories 359
Swope Radiological Clinic 365
Trowbridge Training School 362
Upjohn Company, The V
Woodcroft Hospital 363
Wyeth & Brothers, Inc., John 366
Zemmer Company, The 362

ADVERTISING NEWS

The new drug, sulfanilylguanidine, a water-soluble sulfanilamide derivative, recognized under the new nonproprietory name of sulfaguinadine by the Council of Pharmacy and Chemistry of the American Medical Association, is distinguished by the fact that it is not absorbed readily by the stomach or intestines and as it accumulates in the colon in relatively large quantities, is rated as an unusually swift and potent remedy for use in bacillary dysentery and in conditions of the lower alimentary tract. Many recent scientific articles also recommend the drug for use in pneumonia and streptococcus infections. It is being distributed by E. R. Squibb and Sons of New York and the Lederle Laboratories of New York.

The Holland-Rantos Company, Inc., of New York, have been appointed exclusive distributors for Rantex, the newest development for surgical masks and caps, a patented fibre product, insoluble in live steam, boiling water or common solvents. The masks and caps are exceptionally cool, comfortable, light and free from irritating lint or yarn as well as inexpensive.

The Library of the Medical Department of the University of Kansas has every desire to be of service to the medical profession in the state. Any physician who wishes to avail himself of the facilities of the Library will be welcome both in the use of its periodicals, bound volumes of periodicals, and monographs and text-books.

Under certain circumstances, provided the volumes are not being actively used by the students, the Library will send such volumes as are needed to physicians in the state, on request, for a period of one week, provided carriage charges are paid both ways.

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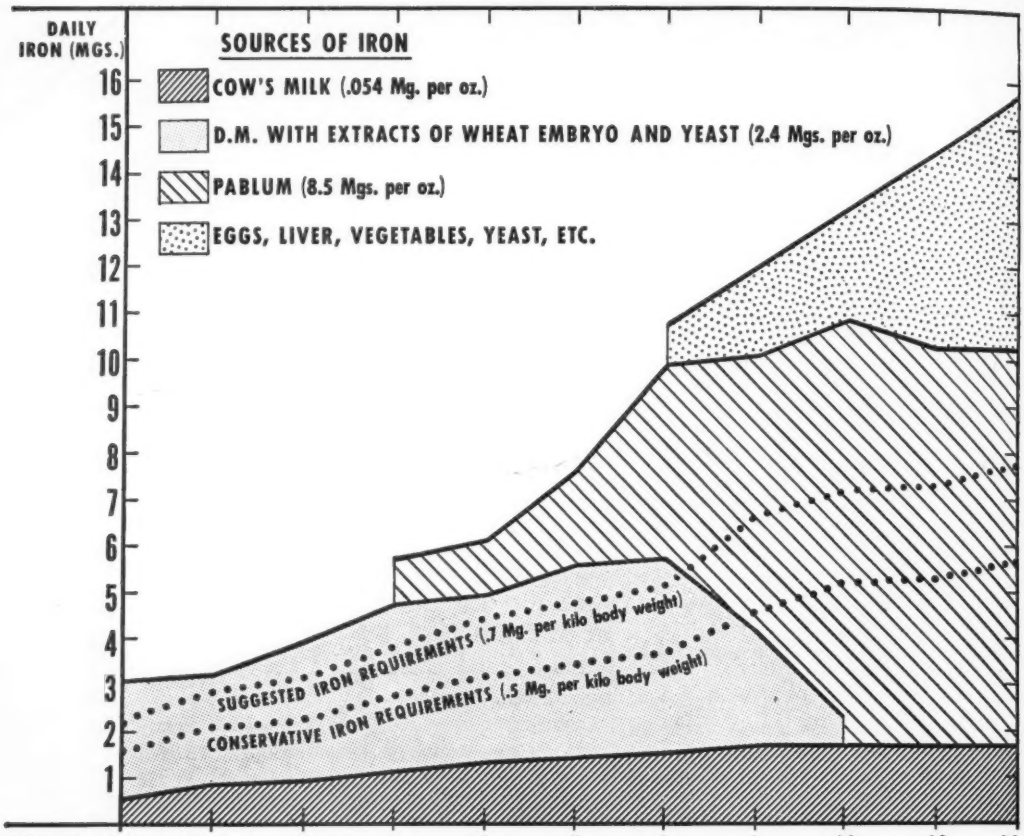

AGE, Mos.	¼	1	2	3	4	5	6	9	12	18	24
WEIGHT, Lbs.	7	9	10	12	14	15	16	20	22	23	25
MILK, Oz.	10	16	18	21	25	26	28	32	32	32	32
D.M. WITH EXTRACTS OF WHEAT EMBRYO AND YEAST, Oz.	1	1	1¼	1½	1½	1¾	1¾	1	¼	0	0
PABLUM, Oz.	0	0	0	⅛	¼	¼	½	¾	1	1	1

During fetal life the infant accumulates iron in its body. After birth, this supply is rapidly depleted, the hemoglobin frequently dropping to 50% by the third month, especially in prematures. Neither breast milk nor cow's milk is capable of offsetting this loss, as they are deficient in iron. An infant requires one-half milligram of iron per kilogram of body weight. This chart shows that when the carbohydrate and cereal supplements contain iron, a sizeable margin of safety can be maintained, not only during the important first six months, but throughout the first two years of life.

The excess iron thus supplied over iron requirements averages close to 75%, and is needed because some iron is unutilized — a large amount in certain cases. In rapidly growing, or poorly nourished infants, and in the presence of infection, the need for iron may be greater than the chart shows; in some cases, periodic hemoglobin determinations may show the need for iron therapy.

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